CHAPTER I

INTRODUCTION

1.1 Background of the Study

Nepal is a beautiful country with snow-clad mountains, ice-cold torrents and green vistas. It is situated in southeastern part of Asia between two giant nations China and India. It is a country of numerous and diverse villages having three distinct ecological regions running from South to north namely Terai, hill and Mountain.

Nepal is a largest natural and cultural museum of the world. It offers wonderful scenes and sights and rich diversity culture and custom. Every part of our country provides enchantment, bait Blue Mountain, or terraced farmlands of hillsides or the forests full of wildlife, flowers and birds. Chitwan National Park is one of the most tourists attracting park of Nepal.

The national parks in the Nepal are Chitwan National Park, Bardia NP, Banke NP, Khaptad NP, Rara NP, Shay-Phoksumdo NP, Shivapuri NP, Langtang NP, Sagarmatha NP and Makalu Barun NP, there are three wildlife reserves as Shuklaphanta Wildlife Reserve, Koshi Tappu WR, Parsa WR and one Hunting Reserve is Dhorpatan Hunting Reserve.

Human-Wildlife Conflict or negative interaction between the people and wildlife has become the fundamental aspect of wildlife management as it represents the most widespread and complex challenge currently faced by conservationists all over the world (WWF 2007). The conflict usually starts when wild animals consume resources meant for human consumption: crop by herbivore and livestock by carnivores (Kissui 2008). When wildlife loses their natural habitats and reduced their natural food sources, they eat agricultural crops, kill/injure livestock and people, and destroy property (WWF 2008).

The human-wildlife conflict is particularly due to the conversion of forest into large scale monoculture plantations, shifting cultivation, overgrazing, forest cutting and encroachment in the home range which reduce the availability of natural food to the wild animals (Bajracharya 2009).

Human-wildlife conflict is defined as any event in which animals injure, destroy or damage human life or property (including destruction of crops), and are killed, injured, captured or otherwise harmed as a result - i.e. both humans and animals suffer from the interaction with each other.

Conflicts often arise when conservation regulations are imposed roughly to avoid natural resources usage, such as grazing land, firewood collection, fodder, medicinal plants and land for hunting without alternatives being provided (McNeely 1995, Lewis 1997) which become a serious problem for land managers and conservationist because such actions lead to negative human attitude towards wildlife, with potentially negative effects for conservation too (Pittigoli 2008).

An increase in human population from hill migrant and gradual forest encroachment for agricultural land have made the situation worse in the lowland and the illegal extraction of forest resources make further escalation for park people conflict (Sharma 1991).

The local people, who once were enjoying free access to areas henceforth covered by parks and were able to meet their needs from "inside" resources, now no longer, have legal access (Nepal and Weber 1993) which also leads people to bear cost not only indirectly through loss of resources such as firewood, fodder and non- timber forest products, but often by direct losses from crop and livestock raiding by wild animals dispersing from protected areas (Kumar 2012).

Many of the park areas in the developing countries are surrounded by the agricultural lands. The people living in and around such national parks have interacted with them in a multifarious ways. Some of them have built an ecological relationship with the park, where as in certain areas the existence of the National Park has been questioned because of the growing conflict over land use rights and practices (Nepal & Weber 1992).

The protected areas are surrounded by the rural settlements and agricultural lands, especially in Terai region of country.

With increasing urbanization and demand of resources, the rising serious problems, the conflicts between park and people, becomes more pronounced and thus become major obstacles in meeting the objectives of the establishment of the protected areas.

The existence of these sorts of conditions results in the unhealthy relationship between the wildlife, particularly the predator and the local people and people may undertake retaliatory killing in response to the economic loss incurred by livestock depredation resulting the reduction in the population of wildlife (Dhami 2011).

The Physical loss by wild animals in each Buffer Zone User Committee (Buffer Zone is an area adjacent to the protected area in which the land use is partially restricted to give a additional layer of protection to the protected area while providing valuable benefits to neighboring rural community) is greater each year in Shuklaphanta Wildlife Reserve (SWR) with a total compensation of Rs. 13,300, Rs. 27,800 and Rs. 7,100 was given to Kalikich, Bageshwori and Shuklaphanta Buffer Zone User Committee respectively and a total of Rs. 6,000 was given to the person injured by wild animals in Sagarmatha Buffer Zone User Committee in the year 066/067 (DNPWC 2011).

Day by day the conflict in natural resource management increased and it became a cause of quarrel between human beings, societies and countries so far.

Various endogenous and exogenous factors such as population growth, globalization of market, environmental and technological changes are imposing new conflict on the Natural resource sector. Many large and small natural resource management projects implemented by different agencies are introducing new conflicts as well as having various negative impacts on society. For example, ignorance of the importance of indigenous knowledge in planning and designing new systems, extortion, alteration of local rights and regulations, replacement of old institutions by new ones, imposition of technocratic solutions, are some of the immediate implications of new interventions (Basnyat, 1995; Benjamin et al.,1994).

Now days Natural Resource Management became a challenging issue to manage different resources like water resource, land resource and forest resource.

It is important to note that all Natural resource related conflicts are created in differentiated and specialized local environments across the country.

The specific natural related conflicts of the Terai are different from those of steep hills and mountains. However, more common problems of both areas are resource degradation, conflict about access, rights and obligations, fair distribution, maintenance and benefit sharing.

These interventions have their own firmly fixed and uniform policy and a rigid procedure based on reductionist-positivist orientation. They are technocratic in nature and generally do not acknowledge local diversities. This is becoming one of the major causes of conflict in natural resource management.

There are several factors causing conflict in the natural resource management. Conflict can arise if the new natural resource management policy of the government contradicts with local cultural practice. The economic motive of people to acquire more from the existing natural resources on a competitive basis also leads to conflict. Conflict is also growing due to the contradiction between environmental and economic interests.

Changes in historical use patterns in natural resources can bring conflict into a community. Similarly, contradictions of legal arrangements and customary practices have promoted several conflicts. Natural resource conflicts produce both positive and negative consequences and alter existing social relations.

They induce change in resource management and utilization, policy process, livelihood strategies, land and agriculture, gender relations, power structure, and individual and collective behavior. In most cases the combined effect of some or many of such factors can escalate or resolve a conflict. Moreover, the intensity and effect of these factors differs between communities and within a community depending on when the effects are felt.

Nepal's most defining feature is its diversity physical, cultural, and biological. The extreme range in altitude from the Terai lowlands in the south to the tallest peaks in

the world along the northern border with Tibet creates a wide range of ecological conditions that have shaped the diverse human livelihood strategies along this altitude gradient. Nepal's long history of human in-migration from north and south provided the basic ingredients for dramatic ethnic and cultural diversity that has evolved over time as human groups have adapted to local ecological conditions and contact with each other.

Shuklaphanta Wildlife Reserve (28°42' 29"- 29°03' 27" North latitude and 80° 0' 08"-80°25' 53" East longitude) lies in the extreme south-western part of Nepal. Initially the reserve covered an area of 155 km² and later in 1994 it was extended to 305 km² (DNPWC 2011).

1.2   Statement of the Problem

Now day's human wildlife conflict is getting more problematic in buffer zone areas. Human wildlife conflicts are increase and happing day by day and rural people who are living in buffer zone area, are getting trouble from wildlife. So, it needs to find out what are the major conflict between human and wildlife in buffer zone area. There are many cause of conflict, here we looking for major cause of conflict.

In buffer zone areas wildlife made damage by eating crops, by killing or injured livestock's, by damaging people houses, by injured or killing human beings.

Here researcher also studies about methods and techniques adopted by the local people to mitigate the conflict about human and wildlife. There are many more problems in buffer zone area which rural people facing.

Therefore the study aims to find out the answer of following research questions:

❖   Which are the major problematic wild animals?

❖   What are the major causes of conflict?

❖   How much damage has been done?

❖   What are the methods & techniques adopted by the local people to mitigate human-wildlife conflict?

1.3   Objectives of the study

To find out the answer of the research questions here researcher set the following objectives for each. So these objectives conclude whole study. The general objective of the study is to explore human-wildlife conflict in study area.

Here the researcher try to find out the answer of research question which researcher put above.

The specific objectives are**:-**

- ❖   To determine the major problematic wild animals in the study area.
- ❖   To identify major causes of conflict in the study area.
- ❖   To assess the value of damage.
- ❖   To explore the methods & techniques adopted by the local people to mitigate human-wildlife conflict.

1.4   Significance of the Study

Only limited research has been done to explore the conflict related to wildlife in Shuklaphanta Wildlife Reserve. Despite a long history of human-wildlife conflict in buffer zone of this reserve, there is no particular study in this buffer zone area. This study was carried out to assess human wildlife conflict in one buffer zones of Shuklaphanta Wildlife Reserve and develop basic information required to minimize the issue of conflict. This study is manly carried in Beldandi VDC of Kanchanpur district which is the buffer zone area of SWR. This study may help to minimize the HWC in buffer zone area and also help to know.

So this study will be helpful for policy makers, researchers and development agencies to make plans and activities for conflict management, conduct various researches in Shuklaphanta wildlife reserve area and other similar area.

For the purposes of this study, human wildlife conflict is defined as any event in which animals injure, destroy or damage human life or property (including destruction

of crops), and are killed, injured, captured or otherwise harmed as a result i.e. both humans and animals suffer from the interaction with each other.

The damage and destruction caused by a variety of animals to human property and sometimes human life is a real and significant danger to many human communities. Likewise, retaliatory killing is a major threat to the survival of many species around the world for which there is global community interest and commitment to their conservation (such as elephants, big cats, bears and wolves.)

As human populations increase and encroach further into wildlife habitat, conflicts between humans and wildlife are set to increase in both frequency and geographic spread. Successful sustainable development requires the harmonisation of both environmental and human development goals, and resolving human wildlife conflict is central to this aim, bringing together the two perspectives in order to create a sustainable future for both wildlife and rural communities.

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1.5   Limitations of the Study

This study is limited study in Beldandi VDC of Kanchanpur district. And this study is mainly focus on the human wildlife conflict in the study area or in Beldandi VDC.

The study is very specific to Shuklaphanta wildlife reserve and the conclusion drawn from this study cannot be generalized for the whole.

But the inferences can be valid to some extent to those areas, which have similar

geographic and environmental settings.

Constraint of time and finance are another major limitation of the study, as there was no funding available. This study is done to fulfill the master's degree in Rural Development at Central Department of Rural Development, TU.

Any kind of prejudices and biasness indirectly committed by the researcher is expected to be taken for granted.

1.6   Organization of the Study

First chapter shows the background of the human wildlife conflict in short and also shows objectives, questions for the thesis topic, importance of the study, limitations of the study and organization of the study.

Second chapter shows the concept of the conflict, human wildlife conflict, outcomes of the human wildlife conflict. And second chapter also describes previous studies of human wildlife conflict in many sectors as crop damage, human depredation, livestock depredation and physical damage by wildlife in buffer zone area and also around the wildlife reserves.

And second chapter also shows people perception towards conservation and conclusion of the review of the previous studies. Conclusion shows that previous studies about human-wildlife conflict were done by various people in different place and areas of conflict and these studies are related to my study topic.

Chapter third shows research methodology, data collecting tools and techniques, sampling technique, location and boundary, data analysis procedure, data type, reliability and validity of data and socio-economic aspect of the study.

In chapter fourth, we analyze and presentation of primary data which was collected from study area to fulfill the study.

Final chapter or chapter fifth shows the summery, further recommendations and the conclusion of the study.

CHAPTER - II

LITERATURE REVIEW

2.1 Conceptual Review

2.1.1   Conflict

Conflict refers to some form of friction, disagreement, or discord arising within a group when the beliefs or actions of one or more members of the group are either resisted by or unacceptable to one or more members of another group.

Conflict can arise between members of the same group, known as intergroup conflict, or it can occur between members of two or more groups, and involve violence, interpersonal discord, and psychological tension, known as intergroup conflict. Conflict in groups often follows a specific course. Routine group interaction is first disrupted by an initial conflict, often caused by differences of opinion, disagreements between members or scarcity of resources.

At this point, the group is no longer united, and may split into coalitions. This period of conflict escalation in some cases gives way to a conflict resolution stage, after which the group can eventually return to routine group interaction once again

Rakhim(2010) notes there is no single universally accepted definition of conflict. He notes that one issue of contention is whether the conflict is a situation or a type of behavior. Rakhim notes the following common elements in the definitions of conflict:

)   there are recognized opposing interests between parties in a zero-sum situation;

)   there must be a belief by each side that the other one is acting or will act against them;

)   this belief is likely to be justified by actions taken;

)   conflict is a process, having developed from their past interactions;

Building on that, the proposed definition of conflict by Rakhim is an interactive process manifested in incompatibility, disagreement or dissonance within or between social entities. Rakhim also notes that a conflict may be limited to one individual, who is conflicted within himself or the intrapersonal conflict.

Wildlife reserve:

In Wikipedia a general concept of wildlife reserve is given as, a natural reserve is a protected area of importance for wildlife, flora, fauna or features of geological or other special interest, which is reserved and managed for conservation and to provide special opportunities for study or research.

Natural reserves may be designated by government institutions in some countries, or by private landowners, such as charities and research institutions, regardless of nationality. Nature reserves fall into different IUCN categories depending on the level of protection afforded by local laws.

2.1.2   Human-Wildlife Conflict

Human-wildlife conflict is defined as "any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife population or on the environment" (WWF 2005).

Human–wildlife conflict refers to the interaction between wild animal and people and the resultant negative impact on people or their resources, or wild animals or their habitat. It occurs when growing human populations overlap with established wildlife territory, creating reduction of resources or life to some people and wild animals. The conflict takes many forms ranging from loss of life or injury to humans, and animals both wild and domesticated, to competition for scarce resources to loss and degradation of habitat.

As human populations expand into wild animal habitats, natural wildlife territory is displaced. Reduction in the availability of natural food sources leads to wild animals

seeking alternate sources. Alternately, new resources created by humans draw wildlife resulting in conflict. The population density of wildlife and humans increase with overlaps in geographical areas used increasing their interaction thus resulting in increased physical conflict.

Byproducts of human existence offer un-natural opportunity for wildlife in the form of food and shelter, resulting in increased interference and potentially destructive threat for both man and animals. Competition for food resources also occurs when humans attempt to harvest natural resources such as fish and grassland pasture (https://en.wikipedia.org/wildlife_conflict).

Human-wildlife conflict has been in existence for as long as humans and wild animals have shared the same landscapes and resources. Human-wildlife conflict does not occur only in Africa. Nowadays human wildlife conflict exists in one form or another all over the world. Conflict between humans and crocodiles, for example, has been reported in 33 countries spanning the tropics and subtropics, and the problem probably exists in many more.

All continents and countries, whether developed or not, are affected by human wildlife conflict. However there is an important distinction to be made between the level of vulnerability of agro-pastoralists in developing countries and that of well-off inhabitants of developed nations (FAO, 2009).

2.1.3   Outcomes of Human-conflict

Human–wildlife conflict occurs with various negative results. The major outcomes of human-wildlife conflict are:

⎰   Injury and loss of life of humans and wildlife.

⎰   Crop damage, livestock depredation, predation of managed wildlife stock.

⎰   Damage to human property.

⎰   Tropic cascades.

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)   Destruction of habitat.

)   Collapse of wildlife populations and reduction of geographic ranges.

(www.wikipedia.org/Conflict)

2.2 Review of Previous Studies

Previous studies shows Human-Wildlife conflict mainly in following issues that human deaths and injuries, although less common than crop damage and livestock killed or injured by wild animal are the most severe manifestations of human-wildlife conflict.

2.2.1 Destruction of Crops

Crop loss by wildlife is common in the adjoining areas of parks and reserves which are considered as one of the main reasons of park people conflict. Due to limited grassland areas within park boundaries and highly nutritious supplement of food in the crop grown in the adjacent agricultural areas made possible that the wild animals may be forced to expand their defense on the peripheral agricultural land of the park (Sukumar 1990).

Not all the individual of particular species raid the agricultural field. Only those animals with home range that encompasses cropland can do so (Jackson 1990).

A Study on "Park–people Conflict in Koshi Tappu Wildlife Reserve" in Paschim Kusaha VDC of Koshi Tappu Wildlife Reserve using interview and scheduled questionnaire in 1997/98 by Limbu & Karki (2003) showed that wild buffalo and wild boar was the major crop raider. Wild buffalo and wild boar was responsible for damaging 85.15 % and 14.84% crop respectively.

During misty and cloudy night, crop raiding was most destructive due to difficulty of detection.

The main reason of human-wildlife encounter was found due to insufficient food in the reserve. Illegal utilization of forest products, cattle grazing, poaching and river fishing in reserve area were the problems created by the local people.

Large number of cattle was found grazing freely inside the reserve, which were the main causes of wild buffalo to come outside onto crop field due to competition of food.

Study of crop damage in the buffer zone of SWR revealed that highest economic loss; (74.28%) was estimated to be paddy, followed by wheat (17.08%) and maize (8.62%). Among the wild animals, highest economic loss (43.29%) was estimated by wild elephant, (28.67%) by wild boar, (24.09%) by chital and (3.92%) by blue bull with the loss of 61.62 kg to 126.33 kg per households (Gautam 1999).

In Chitwan National Park, Jnawali (1989) showed highest economic loss (27.6%) occurred in the rice crops, followed by mustard (21.9%), lentils (18.4%), maize (16.8%) and kitchen garden plants (12.5%) by rhinoceros. During wheat growing season, chital caused the greater damage, whereas during the season of maize and potato, wild boar caused greater troublesome to the villagers (Milton and Binney 1980).

Study in midhill areas (then Shivapuri National Park) revealed that rhesus monkey, Wild boar, porcupine, rat and birds were the most destructive pest (a competitor of humanity) causing higher quantity loss for Maize followed by millet (Paspalum scrobiculatum), wheat, paddy, potato (Solanum tuberosum) and sweet potato (Ipomoea batatas). The total loss estimated for crop damage was NRs. 3, 51,618.74 and the total quantity was 19,011.4 kg per annum (Purkait and Chalise 2010).

Crop depredation by wildlife has also been reported from many protected areas of the world. In Nanda Devi Biosphere Reserve (India), loss of crop near to forest had contributed more than half of the destruction.

Similarly Potato alone represents 43.6% loss and the highest lost was on Kidney beans and the least for amarantha.

Concerning about crop damage, wild boar and monkey were responsible for 50-60% of the total crop depredation, however, porcupine and musk deer also did harm in food grains and horticultural crops (Rao et al. 2002).

But in Sariska Tiger Reserve (Rajasthan), Nilgai and Wild Boar contributed for at least half of the total damage to the major crops (Nagoth 1998).

In Jigme Singye Wangchuk National Park (Bhutan), major financial loses annually was due to crop damage by Wildpigs, Barking Deers, Macaques and Sambars. Among them, the highest rate of damage was caused by Wild Pigs (97%) whereas the damage by Macaque increased only after the establishment of the park in 1993 (Wang et al. 2006).

On the other hand, it has been said that due to construction of Kariba Dam and Kariba Town in Africa, reduced the space originally occupied by wild animals which enhanced human wildlife conflict. Elephants, buffalos, lions, tigers, jackles and wild pigs invaded to residential areas causing great troublesome by destroying vegetable garden and fences, some preyed upon livestock while baboon entered houses, broke windows and asbestos roof sheets and tipped beans (Svotwa et al. 2007).

Similarly, 11 species of wildlife were identified as problematic in Luangwa Valley of East- Zambia among which african elephant caused the most damage (67.82%) and (98.41%) of total wet and dry farming crop incident respectively. Maize and Cotton were the most affected crops (Nyirenda et al. 2011).

On the other hand, in Kaibeli National Park (Uganda), crop raiding by primate and elephant is more common due to the landscape fragmentation, decrease in size and number of wetland and forests (Hartler et al. 2010).

In 2007, a report "A Case Study on Human-Wildlife Conflict in Nepal" of WWF shows that, Jhapa and Bardia were most severely and about equally affected by human-elephant conflict in terms of crop damage as households here had lost nearly quarter of their total annual income from crop production. Shukla on the other hand lost about 13 percent of the annual income which was significantly less than both Bardia and Jhapa.

Among other factors, land use changes leading to depletion of forested areas in the 'edge habitats' appear to have significant bearing on the magnitude of economic loss due to crop raiding by wild elephants. Evidently, Jhapa and Bardia had about equal amount of forests in the 'edge habitats' that is less than what Shukla had in such habitats.

And in the report of WWF (2007) also shows that, Crop raiding by elephants was the major issue in the three sectors with Bardia and Jhapa reporting higher frequency of incidences compared to Shukla. Among crops, the damage to paddy by elephants was most pervasive. A total economic value of crop loss per household per year accounted for NRs, 12,253, NRs. 10108, and NRs. 3391 in Jhapa, Bardia, and Shukla, respectively. Statistically, the loss in Jhapa and Bardia did not differ significantly.

Considering the income from crop production, a household in Bardia (27%) and Jhapa (25%) lost about a quarter of the total income which is double the amount that a household in Shukla (13%) had lost.

Temporally, little over 50% increase in the loss of paddy was observed in Shukla during the period between 1999 and 2002. The same in Jhapa accounted for 30% over the span of five years from 2002 to 2007.

2.2.2 Livestock depredation

When livestock production constitutes a major part of local livelihood, a high level of conflict can occur between livestock owners and wildlife carnivores due to predation (Jackson 1990). Tiger and leopard were identified as livestock depredators in Chitwan National Park (CNP) (Mishra and Margaret 1991, Sharma 1991) and Bardia National Park (Jnawali 2002). Jackal, Indian fox, common mongoose and jungle cat have been reported as livestock lifter around the CNP (Uprety 1995).

Similarly Jackson (1990) found that, Leopard, Jackal, Wild dog and Grey wolf were identified as livestock depredators in Makalu-Barun Conservation Area.

A study in three villages around Kibber Wildlife Sanctuary in India showed 189 livestock death over a period of 18 months by wild predators such as leopard and wolf, where the loss per household was found equivalent to half the average annual per capita income (Mishra, 1997).

In Samburu Heartland of Africa, mostly lion, leopard and hyaena are responsible for killing of livestock (Ogada and Ogada 2004) while in Lake Mburo National Park of Uganda leopard was the most common livestock predator followed by hyaena and African rock python (Tweheyo et al. 2011).

One study in Pendjari Biosphere Reserve of Northern Benin reported that within seven years period (2000-2007), a total of 725 Livestock loses that included sheeps, goats, pigs and cattle's by spotted hyaena, baboon and lion (Sogbohossou et al. 2011).

In Feb.2008, an article on "Human–wildlife conflict in the Kingdom of Bhutan: Patterns of livestock predation by large mammalian carnivores" shows that, Leopard kills accounted for 70% of the total kills over the two years of their study.

Most likely, this is related to leopards being relatively abundant and widespread in Bhutan. Increased predation by leopards is also compounded by their habit of engaging in 'surplus killing', something we observed in three different incidents during their study. A leopard killed 10 sheep in one night at Phobji (Wangdue, central Bhutan), another killed 22 sheep in Gangtey (Wangdue), and a third animal killed 11 sheep in one night at Khoma (Lhuentse, north eastern Bhutan). Surplus killing is not uncommon among cats and other large carnivores.

A study carried out by Gurung and Thapa (2004) in Phoo village of Annapurna Conservation Area in between 2001-2004 on "Snow Leopard (Uncia uncia) and Human Interaction in Phoo Village in the Annapurna Conservation Area, Nepal" showed that annually there was a 4.07% livestock loss because of snow leopard depredation in Phoo village inside Annupurna Conservation Area. The analysis of three year data showed that loss in terms of animal was about 41 goats, 18 sheep, 14 yaks and 1 horse annually and in terms of monetary it was NRs 3, 78,500.00 or NRs 12,617.00 per household per year.

A study on "Human–wildlife conflicts in a fragmented Amazonian forest landscape: determinants of large felid depredation on livestock" by Michalski et al. (2005) was found that clear peaks of depredation during the peak calving period at the end of the dry season. The study was conducted in the region of Alta Floresta, a prosperous frontier town located in northern Mato Grosso from 2001 to 2004 using participatory rural appraisal and lancet map.

The mean proportion of cattle lost to large felids in 24 months for the region varied according to the herd class size (500: 0.82%; 500–1500: 1.24%; 41500: 0.26%) but

was never greater than 1.24%. The highest annual monetary costs were detected in large cattle ranches (41500 head of cattle), reaching US$ 885.40.

2.2.3 Human Depredation

The main reason that arise conflicts between the local people and the park authorities is that government laws restrict access to the park resources in an attempt to halt natural resource utilization (Sharma and Shaw 1993).

However, the park has become a very good source for villagers to fulfill their resources needs through veneering into illegal poaching, logging and hunting which directly conflict with the park objectives (Milton and Binney 1980).

Bhattrai (2009) in his thesis "Man-Tiger Conflict in Bardia National Park, Nepal " found that, 12 people were killed and four were injured in tiger attacks between 1994 and 2007 and four tigers were killed due to the human tiger conflict in between 1989 to April 2009 in Bardia National Park, Nepal.

Sukumar (2003) of his study "The living Elephants: evolutionary ecology, behavior, and conservation"was found that, within eight years (1990 to 1998), 72 % lion attack and 59 % leopard attack case took place in the farmlands in Talala sub-district on the periphery of Gir National Park (Vijayan and Pati 2002) whereas in India about 150 - 200 people were killed every year by elephants during 1980 –2000.

Siddiqi and Chaudhary (1987) analyzed the forest department data and found 554 human casualties in Sundarbans, Bangladesh for a period of 28 years between 1956 and 1983.

Within the period of 27 months (July 2006 - Sep 2008) a total of 265 people were killed mostly by major conflicting species such as hippopotamus and crocodiles in Mozambique.

Among those, 67 % kill cases were found in the Northern Mozambique including the cases of minor conflicting species such as buffalo, Hyaena and leopard (Dunham et al. 2010).

In Kalimanjaro Heartland, Muruthi et al. (2000) reported that 15 elephants had been killed within the time of one year in conflict situation with local people, representing three quarters of the local population mortality.

2.2.4   People's perception towards conservation

People's perception towards conservation revealed that both Bardia and Shukla were more positive towards conservation than Jhapa. This is mainly because of the fact that most respondents here generally accepted the conservation friendly ideas such as reducing disturbance to wildlife habitats, protecting elephants for religious sentiments, and the need for trans-boundary cooperation to conserve the elephant populations (WWF, 2007).

A study on *"Linking Conservation and Development: An Analysis of Local People's Attitude towards Koshi Tappu Wildlife Reserve, Nepal"* by Shrestha and Alavalapati (2006) indicate that households living closer to the KTWR were more likely to reveal negative attitude towards conservation. Similarly, respondents from larger households tend to show negative conservation attitude.

Educated respondents and farmers are likely to demonstrate a positive conservation attitude. The results consistently show that households with poor socioeconomic status and greater dependence on the KTWR for firewood, fodder, and raw materials are likely to possess a more negative attitude towards conservation. Poor households may not necessarily be less concerned about conservation. Sustainable management of protected areas and local support for natural resource conservation would require socioeconomic development.

A study report on *"Residents' attitudes toward three protected areas in southwestern Nepal"* by Allendorf (2007) showed that understanding people's beliefs and attitudes toward protected areas is a key factor in developing successful management plans to conserve those areas over the long-term. Three themes emerged that describe the positive perceptions residents have: recreation/esthetics, environmental preservation, and economic benefits.

Four themes emerged that describe the negative perceptions: negative economic impacts, belief that benefits are for the government or foreigners, fear of wildlife, and negative interactions with park guards. People's perceptions are affected by different aspects of the areas, including the size of the area and people's access to them, management objectives, history, and tourism.

A study report on *"Community perception of biodiversity conservation within protected areas in Benin"* by Vodouhe et all (2010) was carried out around the Pendjari National Park and showed that Commitment of local communities to protected areas is essential for conserving biodiversity. The report also showed that the positive behavior of local communities towards conservation of biodiversity within Pendjari National Park was highly correlated with the current management strategy that involved more effectively local communities, the educational level of participants and their geographical origins.

A study report on *"Local attitude towards community based conservation policy and programs in Nepal: a case study in the Makalu-Barun Conservation Area"* by Mehata and Kellert (1998) showed that people's towards the eco-tourism conservation is highly recommended while wildlife protection was at low priority.

This study recommends that projects should continue addressing the local developmental needs, encouraging women's participation in community forestry.

A study report on *"Understanding local communities' perceptions of existing forest management regimes of a Kenyan rainforest"* by Guthiga (2008) investigated the perceptions of communities towards three existing forest management approaches i.e. a state-led incentive-based approach, a state-led protectionist approach, and a quasi-private, incentive-based-approach in the Kakamega forest in Kenya.

This report showed that local communities' perceptions were expressed through three common underlying components and were involvement in decision-making processes, forest extraction and other mitigation measures and conservation incentives offered. Understanding local community perceptions of forest management and the factors that

influence these perceptions is important for designing management policies that are sensitive to their needs.

The study on *"Local People's Attitudes toward Wildlife Conservation in the Hemis National Park, with Special Reference to the Conservation of Large Predators"* by the Snow Leopard Conservancy (2003) explored the local residents' the imposition of the park's rules and regulations that affected their options for dealing with wild predators, crop damage, resource management and other sources of people-wildlife conflict.

This report showed that levels of crop damage (94%) and livestock depredation (96%) had increased moderately or greatly over the last few decades and majority of respondents (87%) felt that predator control is essential in order to reduce livestock losses.

Here I m going to present major state laws and regulations related to land, water and forests. The origin of many of these laws and regulation lie in the historical dynasties of Shah, Malla, Lichvi and Kirat in Nepal (Upreti, 2001). The following table shows the major laws.

Table 1 Overview of major laws related to land, water and forests

General laws related to NR	Land-related laws	Forest-related laws	Water-related law
Constitution of the Kingdom of Nepal, 1990 Muluki Ain (National Code) 1963 Local Administration Act	Public Roads Act 1974 Land Acquisition Act 1977 Nepal Mines Act 1966 Soil Conservation and	Forest Acts 1993 Forest Regulations 1995 Environment Protection Act 1996 Environment Protection	Water Resources Act 1992 Water Resources Rules 1993 Fix ation of Electricity Tariffs Rules 1993 Vehicle and

1971 Public Offence and Punishment Act 1970 Local Self Governance Act 1998 Solid Waste Management and Resources Mobilisation Act 1987 King Mahendra Trust for Nature Conservation Act 1982 Arbitration Act 1981	Water Management Act 1982 Land Act 1964 Birta Abolition Act 1959 Trust Corporation (Guthi) Act 1976 Tenancy Right Acquisition Act 1963 Land Survey and Measurement Act 1963 Land Tax Act 1961 Mines and Minerals Act 1985 Pasture Land Nationalisation Act 1973 Land Revenue Act 1977	Regulations 1997 Buffer Zone Management Regulation 1996 National Parks and Wildlife Conservation Act 1973 Private Forest Nationalisation Act 1956 Environment Protection Act 1996	Transportation Management Act 1992 Aquatic-Animal Protection Act Trekking and River Rafting Regulation 1984

Source: Bishnu Raj Upreti , Phd. Thesis, P46

Formal laws and regulations are not the only set of rules and legal principles that govern the actions and behavior of people towards natural resource conflicts. In reality people are confronted with a wide range of coexisting, multi-layered formal and informal legal phenomena. In practice the legal system is extremely complex due to its multiple structure and local adjustments. In practice, not only state laws but also religious, customary, and local laws influence Natural resource management and Natural resource related conflict.

To understand management of Natural resource conflict it is crucial to understand the role of legal pluralism, which does not limit the solution of all natural-resource conflicts to the interpretation of statutory laws and governmental regulations. The interpretation of natural-resource rights, the social and economic functions of natural resources and their management practices are different in these plural legal systems in society (Pradhan et al, 1997).

Mere origin of laws and regulations from the state does not necessarily ensure the anticipated results in Natural resource management. All the actors (those who develop and execute laws and those who follow the laws) have to respect these laws and modify their behavior accordingly when involved with Natural resource management. This is a huge challenge for contemporary Natural resource management in Nepal. These legal rules and laws are used by people to legitimatise their claims and counter claims in natural resource conflict. During this process local people interpret these rules differently generating new informal, unofficial rules. In this respect all laws (generated from the source of state power and authority, custom or religion) become intermingled in practice and state law alone cannot govern natural resources.

By critically examining the existing Nepalese conflict management methods and practices, by exploring the weaknesses and areas of improvement I have provided some food for thought to reform the existing conflict management practices. The empirical chapters sufficiently demonstrated that accountability, transparency and effectiveness of the formal practices of CM are seriously undermined by their inherent characteristics such as feudalistic, elite-biased expensive and authoritarian modes of operation.

Informal practices also favor powerbrokers. These are the most important reasons for their administrative and ideological reform. The ability of this exploration to generate discussion and debate among the Nepalese actors is for the future. I am aware that by critically examining the formal conflict management practices, I will be criticized. People who gain from these practices will be threatened and reactive. I believe, however, that constructive criticism generates discussion and debate and provides ample room for reformation. If such reaction and debate is generated one of the objectives of this research is met. (Upreti, 2003)

Mr. Upreti emphasise that management of NR-conflicts reflects complex dynamics that must be understood in order to design successful NRM interventions. Therefore, policy makers must look beyond existing policy and regulatory prescriptions to successfully manage NR-conflicts. If CM efforts are to be effective in managing natural resource and helping poor people to reduce poverty, then it is axiomatic that the CM approach needs to reconsider the structural and procedural limitations (e.g., access, time, legal complexity, etc.) and include powerless people in the mainstream CM process.

Given the limited access to legal services and relevant information available to most poor people, the existing conflict management practices cannot ensure fair justice to all members of community. There is a danger in assuming that the poor are getting justice by enacting laws and regulations. Clearly, giving effective justice to poor and powerless people requires great sensitivity to and respect for their voice, background, objectives and circumstances. CM practices to give justice to powerless people need to avoid imposing solutions developed in an ivory tower.

The empirical cases show that NR-conflicts are complex in nature with enormously high transformation potentials. The forest-pasture and the Guthi land conflict cases demonstrated that they are also powerful catalysts to change established patterns of interactions, power relationships and social structures in the community. These conflicts influence social, economic and political aspects in a rural community. NR-conflicts were reflected in disagreement (spring-water source conflict case), hostilities and social or personal dislocations (ADB -funded irrigation project). NR-conflicts frequently switched to latent and active phases. Conflict management is a mixture of balancing political, social and legal power relationships (e.g., the Guthi land case)

characterized by trade-offs and negotiations, where weak groups of people generally encounter obstacles and difficulties.

And Upreti conclude that Nepalese existing CM practices are not able to address growing NR-related conflict. Political influence and monetary power (corruption) have greatly contributed in making formal processes and practices fail to give justice to the general public. Therefore, the existing formal conflict management practices cannot be taken for granted, as an excuse not to analyze their weaknesses and contextual factors affecting their performances.

The empirical cases in the study provide ample evidence for this. The question is how to make the inaccessible accessible and ineffective effective. It needs greater reform of administrative and procedural aspects of adversarial forums (e.g., police, NRM administration, courts, etc.) at the national level and promotion of the role of collective learning-based, context specific, locally operated alternative forums (e.g., local mediation, interactive negotiation, etc.) at the community level (actual practices). The administrative and procedural issues at the national level rest with the state. However, those who are intimately involved in dealing with conflicts can implement the promotion of alternative practices at the community level.

2.3 Conclusion of Review

Previous studies about human-wildlife conflict show that the major area of human-wildlife conflict was destruction of crop, livestock depredation and human depredation.

This type of conflict is not a general conflict. Because it makes harder livelihood of rural people whose lives near of wildlife reserve. And study also shows this is very crucial problem it harm not only human livelihood but also harm to reserve area and conserved wildlife.

Many more studies were done in this area but no particular study about HWC in the study area so in my study, objectives try to find which one is the most problematic wild animal, which one is the major conflict, how much damage has been done in study area in a year and methods adopted by the local people to mitigate HWC in the study area.

Nepal basically divided into three landscape bands commonly referred to as the Terai Lowlands, the Middle Hills, and the High Mountains (hereafter referred to as the Terai, hills, and mountains). The Terai lowlands are relatively homogenous in terms of topography and climate, while the hills and mountains are ecologically diverse. Two-thirds of Nepal's food is grown in the Terai and half of the nation's population lives there compared with 44% in the hills and only 6% in the mountains. The human population of the Terai has increased dramatically since malaria was eradicated in these subtropical lowlands in the 1950s. Hill people have been moving down to the Terai for decades, displacing indigenous ethnic groups and clearing much of the valuable Sal forests that covered the region.

 Forty-one percent of the land in the Terai is cultivated, compared with 9% in hills, and 2% in the mountains. Agricultural production in the Terai is enhanced by the favorable climate, generally good soils, and extensive irrigation systems fed by water from rivers that drain the Himalaya Mountains. In contrast, soils in the hills and mountains tend to be poor and prone to erosion and landslides and hill irrigation systems are limited in size by the steep terrain. Mountain people rely heavily on livestock for their livelihoods.

Previous studies shows, in many cases there are so many damages done by wildlife in human life related to livelihood sectors.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

A systematic and integrated methodology was followed. Major elements of the methodology include the use of primary and secondary information, field observation, key informant interview, focus group discussion and face to face interaction using checklists. The study area was in the Beldandi VDC of Buffer Zone area of Shuklaphanta Wildlife Reserve.

The household questionnaire survey was conducted in the study site with appropriate sampling size. Informal and formal interview was also done with different key persons. An Excel tool was used for the analysis of the data collected. The collected data were presented in different manner and analyzed critically.

A set of methods employed to accomplish the research objectives thus the research methodology has been discussed in this section. More specifically, it contains study area, source and nature of data, research design, size and section of samples, data collection instruments, methods of data analysis and interpretations. Relevant information on the basic of proposed objectives has been collected using a combination of tools and techniques.

This study was carried out mostly on the basis of exploratory research design as because the study was done focusing on major area of the conflict in between human and wildlife in the study area and descriptive design as well. Besides, the study had made an attempt to describe and explore the things related to human wildlife conflict, such as quantity of livestock, human, crop and physical damaged by wildlife in the study, measures to mitigate adopted by local people in the study area, major cause of conflict and findings have been described. Thus, this study can be categorized as both descriptive and exploratory.

The study had tried to explore and cover four aspects of human wildlife conflict and its role for minimize the conflict between human and wildlife the in the rural study area.

3.2   Location and boundary

Shuklaphanta Wildlife Reserve (28°42' 29"- 29°03' 27" North latitude and 80° 0' 08"-80°25' 53" East longitude) lies in the extreme south-western part of Nepal. Initially the reserve covered an area of 155 km² and later in 1994 it was extended to 305 km² (DNPWC 2011).

Figure 1 Study Area Map
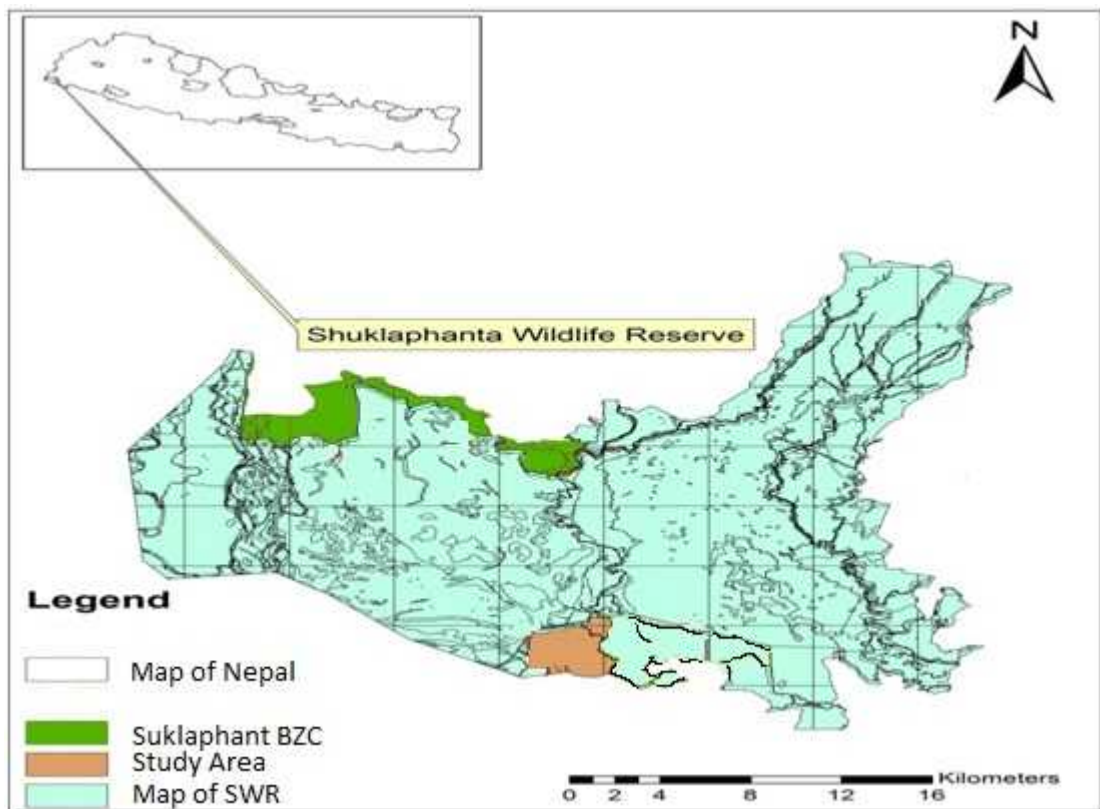
The reserve is bounded in the east and north by protected forest of Kanchanpur district, Lagga Bagga, a national forest of India in the south and Mahakali River in the

west (Aryal and Yadav 2010). A small part of a reserve extended to the north of East-West highway creates a corridor for seasonal migration of wildlife up to the crest of Churiya Hills (DNPWC 2001).

The reserve and its surrounding area comprise of flood plains of various river systems (Mahakali, Bahuni, Chaudhar, etc.) and alluvial sandy soils with altitudinal ranges between 174-1386 m above sea level (DNPWC 2001).

Mahendranagar is the district headquarters of Kanchanpur district at a distance of 694 kilometers from capital city Kathmandu. It is Nepal's farthest western district in the Tarai and shares its southern and northern borders with India. Its population is one of the fastest growing in the country, mainly due to migration from the northern hills and partly also to the influx of the Tharus from adjoining districts to the east.

Forest covers some 54 percent of its area including 311 sq. km under a Wildlife Reserve. Over 36 percent land is under cultivation and 20 percent of it is irrigated (www.welcomenepal.com).

3.2.1 Climate

The climate is sub-tropical with three distinct seasons. Hot and dry summer season starts from the third week of February and lasts up to June. June is the hottest month of the year with mean maximum temperature of 36.17 ºC.

After monsoon season cold winter season starts and temperature reduces continuously. January is the coldest month of the year with average minimum temperature of 7.31 ºC recorded from 2000 to 2010. Monsoon (Rainy) season starts from mid June to last week of September.

Maximum rainfall was recorded in August. The mean annual rainfall of the season from 2000 to 2011 was 1356.7 mm which was 78 % of the total average rainfall of the year. Relative humidity remains high throughout the year except April to June. Average minimum and maximum relative humidity recorded from 2000 to 2010 were 64.05 in April and 95.29 in January respectively.

3.3   Types of Data

Both, Qualitative and Quantitative types of data are used in this study. The first enumerates the abstract aspects viz. sentiments, feelings, agony and so on, while the other concentrates on the numerical values.

3.3.1   Nature of data

The nature of data in this study has relied on both the qualitative and quantitative ones. The qualitative data are used regarding its vitality for the study.

Statistics of the institutions and their activities are mostly quantitative in nature while the value of damage of crops, damage of physical infrastructures, livestock depredation and killed, human damage are qualitative in nature. In this study the qualitative data are used to describe the methods used to mitigate the HWC, problematic wildlife and the cause of conflict in the study area.

Basically the qualitative data's are the representation of non-numeric values that can't be expressed in number. Hence the data collected and used are qualitative in large portion and quantitative data has been sufficiently utilized to meet the purpose of the study as per need.

3.3.2   Sources of data

Sources of the data in this study are primary in majority. Secondary sources of data are adequately used during study process. The primary data are collected from field work applying different data generation techniques. As per the need of research problem, the researcher has utilized secondary source of data obtained from journal, Books, Magazines, Reports and other related literature.

The primary data are collected from the field study. The data collection tools and techniques such as interview, observation have been used to collect adequate and reliable information. Besides, the secondary source of data's that has been published by the former researchers, writers and relevant co-workers has been taken into account.

While collecting the data the following steps have been considered:

⟩ The researcher has given priority on primary source of data. For this purpose, proper data generation techniques have been adopted.

⟩ As per the need of the study, to make it more reliable and valid secondary source of data viz. journals, books articles, magazines and other related materials have been well manipulated.

⟩ To co-relate the primary and secondary data to each other consequently and logically appropriate standard of methods have been applied in course of data generation.

3.4 Universe and sampling

The households of Beldandi VDC are the unit of analysis in this study. There are 3,022 households in Beldandi VDC (CBS, 2011) and which VDC is the universe of the study. This study has followed 540 near distance household from the SWR of Beldandi VDC, here researcher applied simple random sampling method in 540 nearer distance HH for survey. Simple random sampling is used to select population form universe as study demand to find out the answers of research questions. Through this sampling, from 540 households which are nearer the SWR we selected 60 households randomly for this study purpose as they cover the whole study.

To assess the objectives of the study, the Household study was imperative. It has made the study reliable and valid by which the HWC in the study area have become crystal clear. Household study was apt according to the nature of the study. Elder members of 60 households were inquired during the study.

3.5 Data Collection Technique and Tools

Data collection tools are very sensible to choose and handle. Wrong or inappropriate tools lead a research to unreliable and unauthentic result, while a right technique leads toward the authentic one.

This research study has focused on the reliable source of data. Following data collection tools have been applied.

3.5.1 Household Survey

The household survey based on this thesis is structured and semi-structured to collect the realistic and accurate data. It was difficult to found household head as most of them remained busy all over the time. Thus, the information needed was pre-planned and memorized so that it could be gathered from the household survey.

Both the qualitative data and quantitative data were obtained through household survey.

Such data were related to the type of damage, problematic wild animal in respondent field, how they reply the wild animal in their field and fencing used by government in study area and social interaction of the respondents.

During our survey, most of the respondents were inquired in different interval as per the necessity for detail information.

3.5.2 Observation

Direct observation method is regarded as the one authentic method of obtaining the reliable data. It will be fruitful for the researcher to analyze the HWC on the locale. "Seen are far better than listened," a proverb hits the background that most of the comparison made must be determined by the fact how it was before and how it is now.

To identify the change, observation is regarded as one and only the reliable tool as it makes the collected data authentic, reliable and valid. The facts seen by the eyes are more virtually and can easily be believed. On the base of this background this paper tries to compare the artifacts that existed before and the circumference that is now.

The earlier artifacts did not so long existed but can easily be identified how it was. The pictures that were captured before and the experiences of the respondent are compared with the present existence. The qualitative data to support for the generalization of the subject is gathered from observation. From this method the information on feeding habit, use of domestic appliances, and native system of farming, house type and livestock keeping were obtained.

3.5.3 Key Informant's Interview

The people who are familiar with the specific area such as conflict, SWR, all knowledge of VDC environment etc. are selected as the key informants for the study. For the valid and reliable information 5 key informants from different sectors are selected. Among them, two are from the elder members of the society representing the local based organizations, a social worker, the secretary of the VDC and the ward chairman.

All the VDC level information was obtained from the VDC Secretary. The information related to the study area such as households, population, farming and animal raring etc were obtained from the ward chairman.

Similarly the information related to the HWC, trend of HWC, methods applied by government to minimize the HWC etc are obtained from the elderly members of the society.

3.6 Data Processing, Analysis, Interpretation and Reporting

The collected data were analyzed qualitatively as well as quantitatively. Questionnaire responses were edited, coded and analyzed using Ms-Excel 2007 to generate crop loss, mitigation measures and time of wildlife conflict.

For coherent and ordered result of the study, data processing analysis and reporting in scientific ground is most. This research study has undoubtedly followed aforesaid means and methods to make the study more coherent and concrete.

For this purpose, following methods has been adopted for analyzing and verification of data which is considered to be helpful for a readable report:

⅃ For the better organization of the study, categorization, grouping and encoding the raw data has been administered adequately.

⅃ In case of any errors that may appear in course of data editing and verification sufficient alternative methods has been applied.

⅃ The findings obtained by data analysis have been interpreted and generalized associating the different variables regarding their qualitative and quantitative nature.

) After processing analysis and interpretation of data, an organized and concrete report has been prepared unambiguously in logical sequences.

3.7 Reliability and Validity of Data

Reliability and validity of the data is the prime factor of any research study. This research has focused on obtaining reliable and valid data. Because this study is relied on the first hand primary information data which it generates obviously is reliable.

Similarly secondary data collected from different source are regarded very fruitful. But adequate precaution has been paid on the nature of the data and its source. Only the authentic and valid data such as the annual report, journals and periodicals published from concerning authority viz. VDC and government has been manipulated.

For authentic and valid data proper care has been given on rapport building process with native people and concerning authority. In course of study any unforeseen errors has been terminated on time quickly. Data has been generated based on the conceptual framework as per the research design.

3.8 Socio-economic Aspect of the Study

The oldest and original inhabitants of this region are Tharu communities who have been living in the area even before the establishment of SWR (Bhattrai et al. 2008).

In the past, they lived in enclaves of dense forests, kept different types of livestock and practiced shifting agriculture but this practice does not exist today due to shrinkage of forest cover (Bista 1987).

After the eradication of malaria in 1950s hill people migrated to the Tarai where Tharu become the minor community (Sharma 1991). Nowadays, these Tharu communities are facing complex problems and threats to their livelihood.

Regarding caste/ethnicity composition of household in the buffer zone, about 62 percent of households belonged to Brahmin/Chhetri/ Thakuri castes, followed by Kami/ Damai/ Sarki (18%) and Tharu (19.35%), and others (7%) respectively (Yadav 2007).

Traditionally, local people depend upon the forest products (timber and non timber) for their subsistence economy.

Agriculture is the major economic enterprise and people here cultivate paddy, maize, wheat, mustard, peas and other lentils. In addition to this, they also raise multiple species of livestock such as cow, buffalo, ox, goat and sheep for their livelihood (WWF 2007).

CHAPTER IV

DATA ANALYSIS AND PRESENTATION

4.1 Type and Intensity of damage by Wildlife

Here we analysis and interpret collected primary data from field survey. We describe all data in table, figure and in sentences and in the basis of data analysis we also draw conclusion according as objectives related to this study. This chapter is most important for draw a conclusion from it.

Here we are going to manipulate, filter, tabulation and present data in pie chart, bar chart etc. By the help of those charts and table we are going to present data below.

4.1.1 Type of Damage

The questionnaire survey with household's survey revealed that crop loss, property/physical structure damage (house/shed/toilet etc.), livestock depredation and human injury were most common in the buffer zones.

Approximately 75 % of the respondents had experienced only crop loss, 10% and 13.33% of the respondents had experienced property and livestock loss respectively.

Human injuries by the wildlife in the study area were low (1.67%) as compared to other damage. Following pie chart shows that the type of damage (in percent) most occurred in the study area in the year.

Here clearly, field survey shows that crop damage in the study area was mostly occurring problem by the wildlife. Secondly most occurring problem was Livestock depredation seen in the study area. And also from key informant interview shows that the crop damage and livestock depredation was mostly repeating problem in study area by wildlife.

Here according to survey in less percentage problem seen in physical and human damage in the study area.

So we can say that crop damage is the serious problem in the Beldandi VDC.

Figure 2: Most occurring damage type by wild animal in the study area
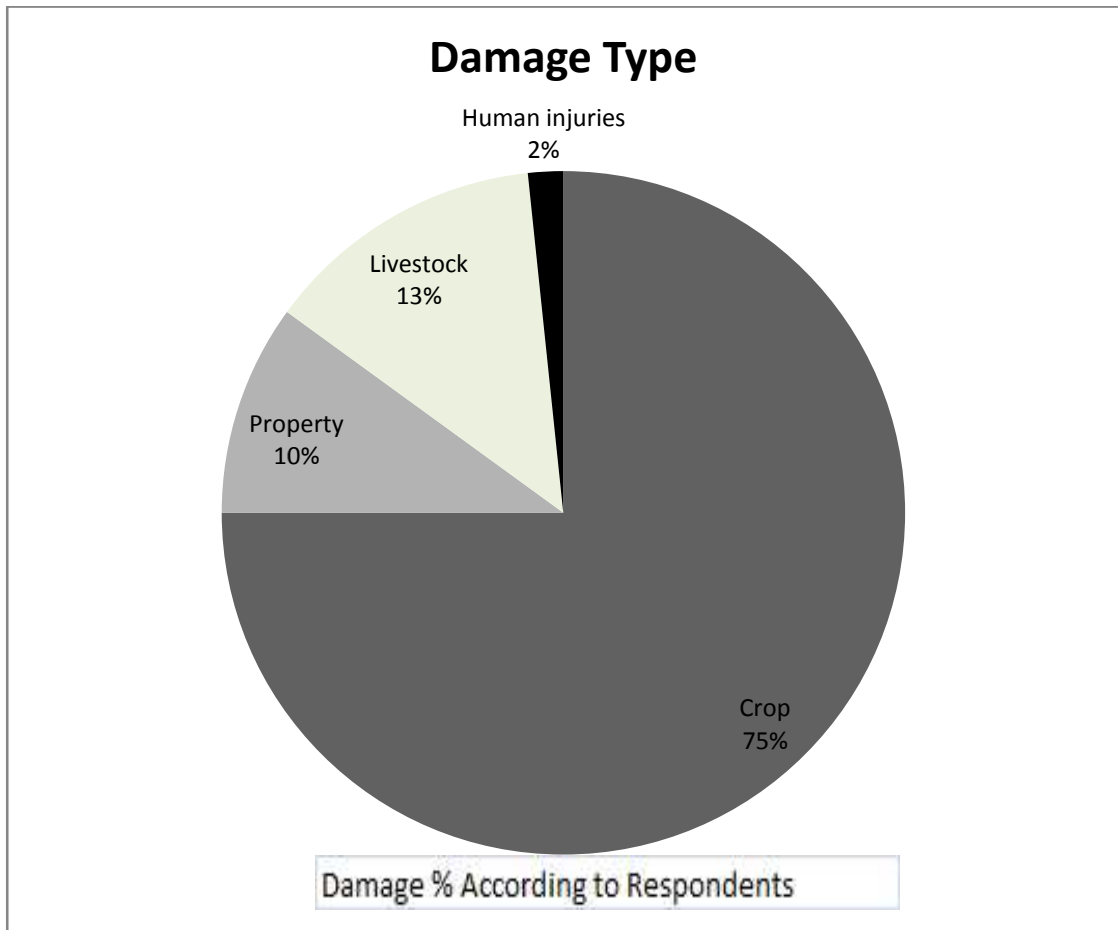
Therefore I can conclude from above that most occurring conflict (according to respondent 75%) is crop damage and respectively (13%) livestock, (10%) property and 2% human injury in Beldandi VDC.

4.2 Major Problematic Animal

Major conflicted species for crop damage were Chital, Wild Boar, Elephant, Neilgai, Peacock, Hare and Monkey were the problem animals in the study area. Among them Chital, Wild boar, Monkey, Elephant, and Nilgai were the most common wildlife species that conflicted with people.

Here 73.33% of the respondents claimed Wild Boar as the most problematic wildlife pest followed by Chital (10%), Nilgai (6.67%), Monkey (5%) and Elephant (5%).

Parrot and Rat are also problematic spices for damage of crop in the study area according to respondent (N=45).

Figure 3: Figure shows the major problematic Wild animal for crop damage in the study

Source: Field survey 2016

37
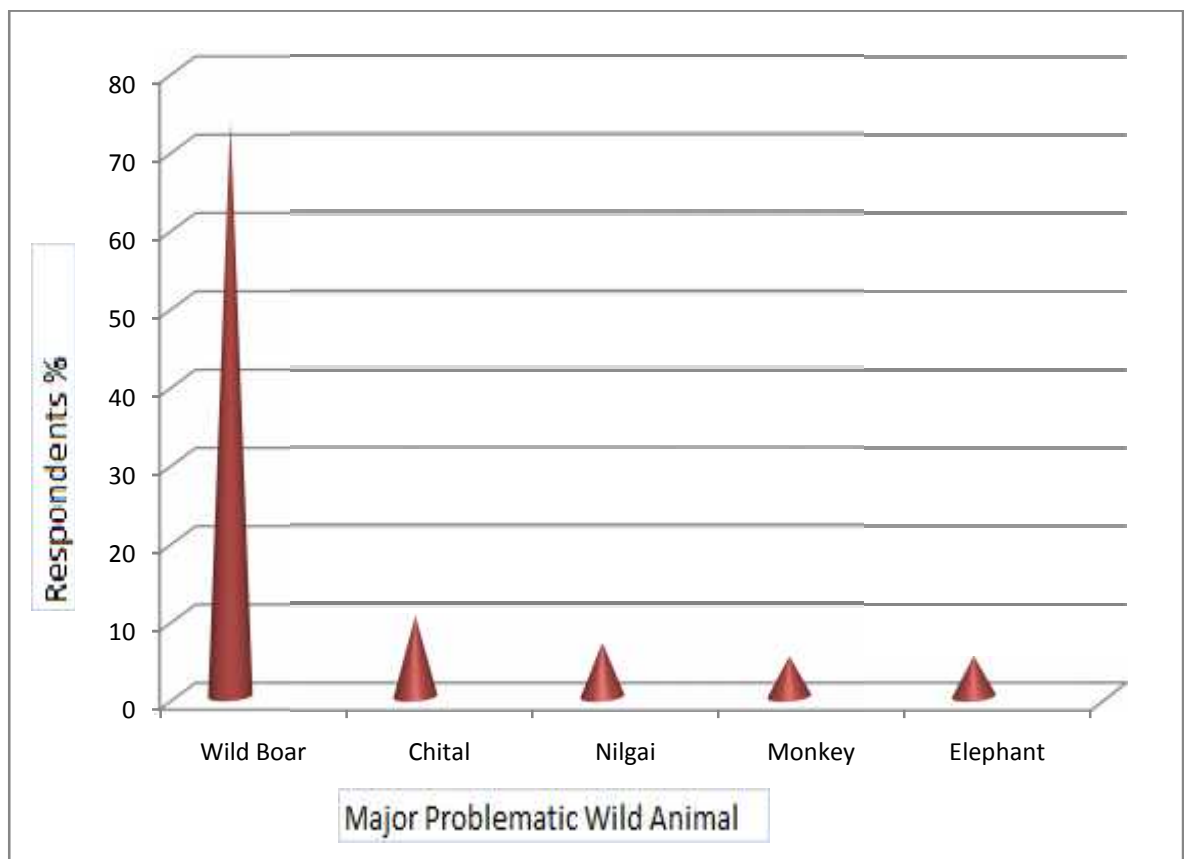
Tiger, Jackal and leopard were also the conflicting species for livestock predation and human casualties. From observation we can say foot marks of various species and their indirect signs also indicated their active presence in the area. According to the field survey Jackal is most livestock damaging wild animal followed by leopard and tiger in the study area.

4.3 Major Cause of conflict

There were several causes of conflict in the study area. By the field survey 33.33% respondents believed that food deficiency inside the reserve was the main cause for the wild animals to visit crop land and similarly 25% respondent thinks no fencing, 16.97% respondent thinks increase in wildlife, 13.33% thinks deforestation and 11.67% respondents thinks search for palatable food are the major causes of conflict in the study area. Furthermore, absence of fences in the boundary areas, increase in the number of wild animal, deforestation and animals search for palatable food and water are other causes of conflict in the study area.

Figure 4: Major cause of conflict in the study area in between wildlife and human
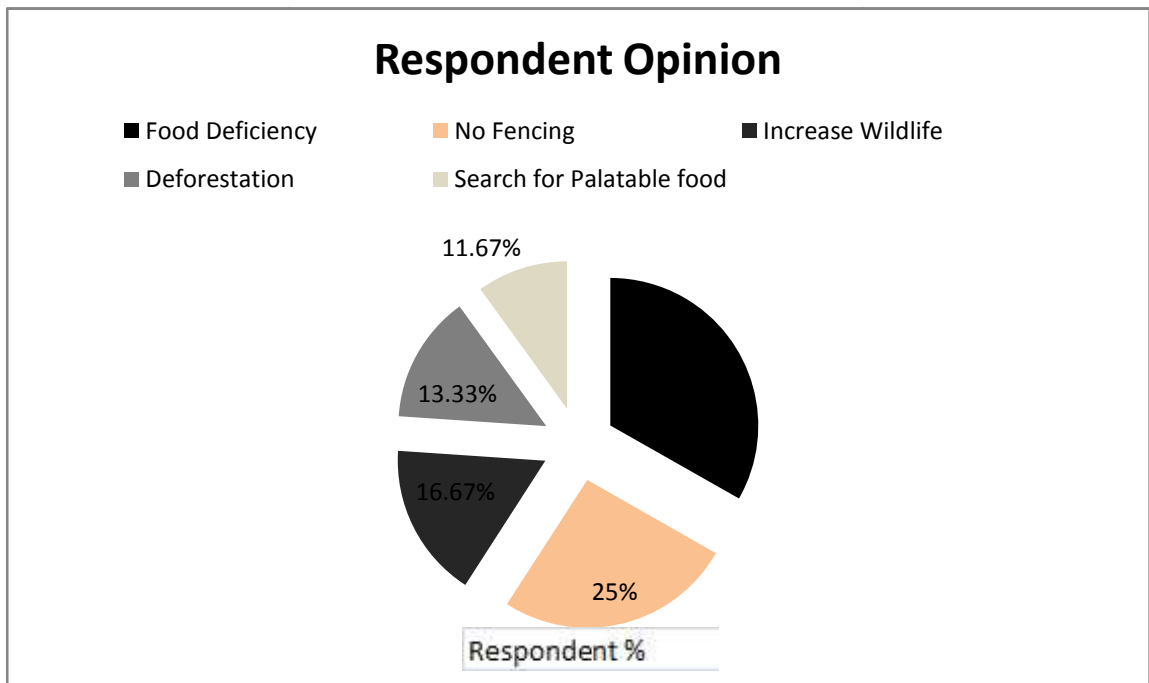
Source: Field survey 2016

4.4 Value of Damages

4.4.1 Crop Damage

Most of the people in SWR are engaged in agriculture. The major crops grown are wheat, rice, mustard, maize, pulses and vegetables in their field. Surveyed HH were partially and fully grow crops in their field. The table shown below describes about the how much and which crop in how much land and what is the expected yield in Kattha and yield and damage this year in the study area. This table also shows total production of last year and total crop damaged by wildlife in the study. This data was obtained by house hold survey in the sampling area through questionnaire.

Table 2. Quantity of crop loss due to wildlife

S. No.	Name of crop	Land cover (Kattha)	Expected Yield	Yield this Year	Total loss(Kg)	Expected Yield Per Kattha
1	Wheat	892	80280	70100	10180	90
2	Mustard	45.5	1137.5	937.5	200	25
3	Paddy	911	100210	85255	14955	110
4	Maize	65	4550	4237	313	70
5	Pulses	55	1210	1100	110	18
6	Vegetables	41	2460	2010	450	60
Total		**2009.5**			**26208**	

Source: Field survey 2016

In sampling area wheat was planted in 892 kattha (N=57 respondents), mustard in 42.5 kattha (N=30), paddy in 911kattha (N=60), maize in 65 kattha (N=32), pulses in 55 kattha (N=52) and vegetable in 41 kattha (N=60). There was a total crop loss of 26208 kg in weight. In total loss, Wheat damage accounts for about 38.84 % of loss in weight, paddy (57.06%), mustard (0.763%), maize (1.19%), pulses (0.42%) and vegetable (1.72%).(Where, N=Number of respondents)

Figure 5: average annual yield of crop and yield this year after damage
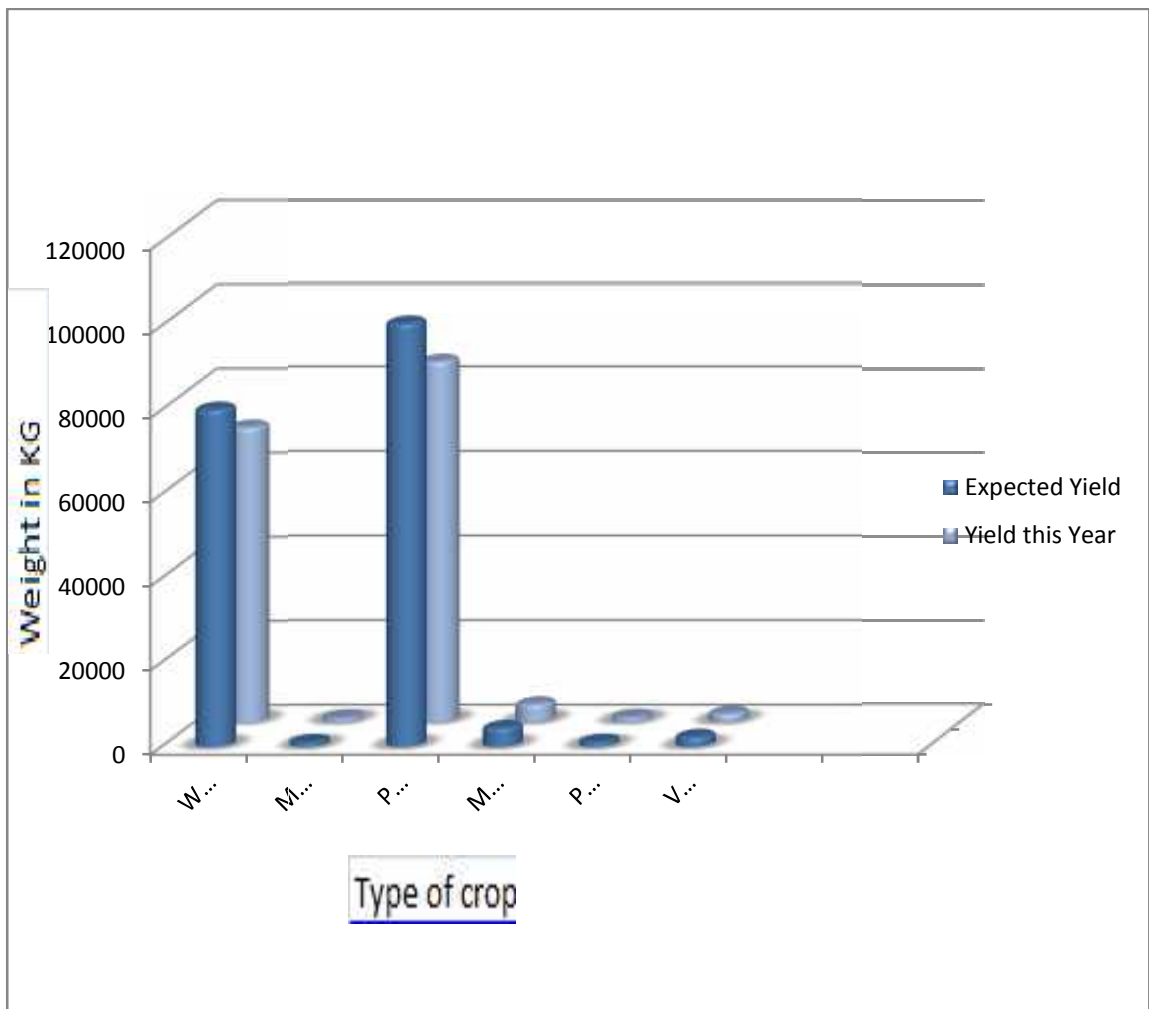
<div align="right">Source: Field survey 2016</div>

4.4.2 Physical, Livestock, Human Depredation

Threats by wildlife to physical property and livestock were higher while the human casualties were low (Figure 3). Mostly tiger, elephant, leopard and jackal were the problematic wildlife species causing human injury, physical damage and livestock killings. Livestock's (goat, cow) were killed when the livestock goes nearer to the wildlife reserve for grazing.

Table No 3. Physical, Human and Livestock depredation in last year

Depredation	Number of event/kill or injured	Problematic wildlife	Remarks
Physical	House damage-1	Elephant	
Human	Not seen last year		Past years it seems two or three cases but it not seems last year.
Livestock	3 Goats and 2 Cows were killed	Leopard/Tiger	
	20 Hens were killed and eaten	Jackal and jungle Cat	

Source: Field Survey

Above table shows that 20 hen killed by jackal and jungle cat, 3goat and 2 caw were killed by leopard and tiger and one house were damaged by elephant in the sampling area. There was no incident of human injured or killed last year in this VDC. So we can say livestock damage is less in comparison to crop damage.

4.5 Measure to Mitigate Conflict adopted by Local people

Conflict must be minimized because if it increases it carries out many problems and imbalance in the livelihoods of both sides. Here local people adopted some measures to mitigate HWC in the study area.

1.   Focusing light at night
2.   Night Watching/Guarding
3.   Making noise/Producing different noise by different instrument
4.   By Making human statue in the field
5.   Throwing Stone
6.   Chasing by human reaction

According to respondent's wild animal were come at night time more than day time and so here are more measures used at night to minimize HWC at local in the study area.

And night watching/guarding is mostly used measure to minimize conflict in the study area.

4.6 Discussion

The degree and extent of human-wildlife conflict is determined by multiple factors, which may be influenced either by human or wildlife or both.

Migration of people from different areas for the better agricultural products, demand for firewood, fodder and constructing materials causes pressure on the forest. Whereas, killing of livestock, raiding of crops and damage to the physical structures by wildlife determine the extent and nature of conflict in that area.

Crop damage is the main issue according to the respondent (75%) in the study area.

Main cause of crop damage is Wild boar and is more seen in the field and which also survey show. Chital, Elephant, Nilgai, Parrot, Peacock, Monkey, Langur and Deer are also cause of crop damage less than the Wild boar.

From key informant interview it can also say that crop damage was main cause of conflict in the study area and which also show field survey.

Mainly the wild boar comes in group at night in the field and they not only eat crop and vegetables also damage them. So wild boar is most conflicted wild animal in the study area. Here people use to chase the wild boar by night guarding, making noises, make fire, by making man statue of cloth in field, throwing stone.

Field survey also shows that the scarcity of food in the reserve is the main cause that wildlife's are come out from reserve in search of food and they also like to eat crop and vegetable.

The survey shows that the livestock's killed and injured by Leopard, Jackal and Jungle Cat. Cow, goat and Hen were killed mainly eaten/killed and injured by wildlife.

Human depredation was not seemed last year as previous years in the study area. In the study area crop damage, physical property damage and livestock killing were the four major types of damages. In all the study area damage to Paddy and wheat was the highest among other crops.

Average damage each paddy and wheat are 14955 kg and 10180 kg respectively. The higher damage of wheat was probably due to more palatability and protein richness than the food plants inside the reserve during late wet season (Sukumar 1989).

At Bardia National Park maize damage was in higher ratio followed by wheat (Ayadi 2010) but in Koshi Tappu Wildlife Reserve (KTWR) most of the damage was caused to wheat by wildlife in young to adult milky stage (Limbu and Karki 2003) which was similar to my finding in SWR.

Livestock and property damage by wild animals is the second major problem. Wild male elephant is responsible for higher damage followed by leopard, and jackal. The elephant cause higher damage at the time in search of estrous female (WWF 2007), although this case did not happen during this study period.

Bhandari (2011) reported that the wild elephant was the major contributor for higher monetary loss in three buffer zones of SWR. Gautam (1999) reported that two persons were killed by male elephant during her field study.

Very few cases of human-carnivore conflict were recorded. This might be due to the presence of higher number of prey species in their habitat. Karki (2011) compared overall density of prey species of SWR with overall densities of other protected areas of Nepal, reveals that SWR has highest density of ungulates followed by CNP and PWR (Parsa Wildlife Reserve).

Local people believed that natural food deficiency was the major cause of conflict in the reserve. Lack of fence, increase in number of wildlife, deforestation, search of palatable food and water were the main reasons for the attraction of wildlife towards the agricultural field.

During the field study it was observed that the cattle reached up to 4km (approx.) inside the reserve boundary for grazing. Grazing larger number of livestock in the forest area reduce the quality and quantity of forests, which influence the conflict in the area.

Food deficiency, increase in number of wildlife, search of palatable food and water were the causes of conflict in Banke National Park (Ayadi 2011) which was similar to my finding in SWR.

Limbu and Karki (2003) also observed lack of sufficient food in the reserve, palatability of field crops and lack of fences in the boundary of the reserve were the causes of conflict in KTWR.

These causes of conflict are most common in the buffer zones areas. And these causes of conflict arise because management sector of conservation is weak and lack in awareness of local people about conservation.

According to respondent Food deficiency inside the reserve is major cause of conflict to come out wild animal outside the reserve.

So buffer zone area people must be aware about the conservation and their benefit to them and for nation in balancing of ecosystem and for clean environment.

Weak fencing from reserve side is another cause of conflict because the wild animal can freely reach to villager's crop land. To stop this type of conflict reserve management should build high fencing in village area.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMEDATIONS

5.1 Summary

In short the purpose of this study is to fine out the situation of human wild life conflict in Shuklaphanta Wildlife Reserve of Beldandi VDC. The objectives of the study are to find out the major causes of conflict, most problematic wildlife, value of damage and the local methods to minimize the conflict in the study area. Here research shows that, in the study area crop damage is major cause of conflict in comparison to physical damage, livestock kill or injured and human damage.

Major problematic wild animal in the study area is wild boar among nelgai, elephant, monkey and chital. Wild boar, chital, elephant, nelgai and monkey are most crop damaging animal in the study area which are mostly seen in the field at night in group according to respondent and they usually damage most crops at night.

Research survey also shows that value of damage is mostly done by wild boar. Highly damaged crop is paddy flowed by wheat, maize, vegetable and pulses respectively. Here in the study area local people use to chase the wild animal by making noise, throwing stone, night watching, making mans cloths statue in field. People those who are living nearer to the reserve they are highly in conflicted with wildlife.

Therefore it can conclude that this amount of damage seems to affect livelihoods of human in the study area. So it is necessary to minimize the conflict by the responsible institutions in coming days. The trend of human wildlife conflict was increasing due to which people kill wildlife by trapping or chasing them.

Damage of crop and physical property was higher in Beldandi VDC by wild boar. Tiger, leopard, wild cat and jackal were the major livestock predators. Frequency of chital and Nilgai visiting to cropland was remarkably different in different Wards whereas chital and monkey were significantly different in different seasons.

Finally, this research shows that the study area Beldandi VDC there is conflict highly in crop damage which is followed by livestock injured/killed and physical property damage respectively in between human and wildlife.

5.2 Conclusion

❖ There were major problematic species including chital, wild boar, elephant, monkey, peacock and Nilgai while chital, wild boar, elephant and parrot were the major crop raiders. Increased damage by wildlife was due to food deficiency in the habitat, increase number of wildlife, lack of physical barrier and structure to control wildlife movement into the private property.

❖ Deforestation and searching of palatable food was also cause of conflict with wildlife in the study area. It was found through the survey that in the study area above causes were the major cause of conflicts.

❖ Crop damage and physical/property damage was the major problem faced by the people in the study area. An estimated total loss of crop 26208kg (=Rs. 6, 01, 240) Annex and physical/livestock (=RS. 75,000) per annum. This study conducted during November 2015-May 2016 showed that the distribution of damage caused by wildlife was high in areas near the reserve. Crop damage, property/physical damage, livestock depredation were the major types of damages.

❖ The use of traditional preventive measures such as making noise, throwing stone, making statue at field, night fire, drumming, night guarding/watching by both people and dog were partially successful to chase wild animals.

5.3 Recommendations

Based on the research, following recommendations have been derived:

❖ Good and effective physical barriers like strong wall with wire fencing on it should be constructed to prevent wildlife entering into the human habitat.

❖ Behavioral study of the most conflicting species should be done in order to confine them within the boundary of reserve by protecting their habitat, live food and creating water sources, which are lacking inside the reserve.

- ❖ Compensation for all types of losses/damages should be provided to help people in making the positive attitude towards the conservation of wildlife.

- ❖ Local villagers should be encouraged to introduce better breeds of livestock which reduce open grazing so that the reserve will have sufficient food for the wildlife.

- ❖ Local villagers must be aware about the modern measures to mitigate conflict.

- ❖ Local people should be stopped graze their livestock's inside the wildlife reserve.

- ❖ All other sectors need to be fully aware of the provisions of the Act and their responsibility to include HWC in TOR for Environmental and Social Assessments.

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Annex I

Questionnaire for HH Survey

Background Information

Household no………

Name………………..

Ward no…………….

Age…………….

Family size:

Questionnaire for Objective One: To determine the major problematic wild animals in the study area.

1) Have you ever seen any wild animal in your field?

   (a) Yes   (b) No

2) Which wild animal did you seen?   Ans…………

3) Which wild animal occurring most in your field?   Ans…………

4) How much often do they come?

   (a) Every day   (b) Twice a week

   (c) Once a week   (d) occasionally

5) Do they come in single or group?

   (a) Single   (b) Group

6) How much?

   a) 4   b) 5   c) 6   d) more than 6

7) How do they back to reserve?

   a) Themselves b) By human reaction c) Others

8) In   your   opinion   which   wild   animal   is   most   problematic?
   Ans…………………

Questionnaire for Objective Two: To identify major causes of conflicts.

9) What do you think Human-wildlife conflict is getting more problematic?

    a) Yes   b) No

10) What do you think which one conflict most occurred?
- ⎰ ( ) Damaging house
- ⎰ ( ) Human harassment (Injured/kill human)
- ⎰ ( )Damage crop
- ⎰ ( ) injured/Kill livestock
- ⎰ ( ) Others

11) What are the causes of conflict?
- ( ) more wildlife
- ( ) no fencing
- ( ) deforestation
- ( ) food shortage
- ( ) other

12) Which one is the main cause of conflict?

Questionnaire for Objective Three: To assess the value of damage.

13) How much land do you have (in kattha) ?

    Ans………….

14) In a year what are the verities do you grow in your field?

15) Which crop do you grow in how much land?

Types of crop	Kattha
Rice	
Maize	
Mustard	
Pulses	
Wheat	
Vegetable	

16) In generally which crop has how much actual production & how much crop damage in a kattha in year?

Crop	Production	Damage
Rice		
Maize		
Wheat		
Pulses		
Mustard		
Others		

17) How much and which livestock are killed and injured by wildlife in last year?

Animals	Killed	Injured
Goat		

Sheep		
Buffalo		
Cow		
Hen		
Pig		
Other		

18) Any person were injured or killed by wild animals in your family?

( ) Yes ( ) No

If yes then, Injured…….. Killed……….

Questionnaire for Objective Four: To explore the methods & techniques adopted by the local people to mitigate human-wildlife conflict.

19) Do you chase or repel wild animals approaching your house or crop land?

(a) Yes

(b) No

20) If yes, then which methods do you apply?

(a) ………….
(b) ………….
(c) ………….

21) Is there any reserve authority office or camp near your house?

( ) Yes ( ) No

22) Do you think Human-Wildlife conflict will increase in the near future?

Yes (………………..) No (…………………)

Annex II

Questionnaire for Key Informant Interview

1) What is the situation of human-wildlife conflict in the community?

2) What are the causes of the human-wildlife conflict?

3) Which wild animal is most problematic wild animal?

4) What are the methods and techniques adapted to reduce the human-wildlife conflict in your community?

5) What are the solutions for the reduction of the human wildlife conflict?

6) What are the problems that you are facing in such type of conflict?

Annex III

Check lists for Observation

1) For major problematic wild animal

   a) Foot marks

   b) Dung

   c) Feather or Hair

   d) Other mark made by wild animal

2) For access the value of damage

   a) Damaged crops and vegetables in the field

   b) Wild animals in the field

   c) Bones of livestock's

3) For measures adopted by local people to minimize HWC

   a) Human statue of cloths made in the field

   b) Night watching house in field

   c) Ash of firing near the crop land

   d) Noise making instruments at night watching house

Annex IV

Rate of different crops in present market

Name of Crop	Local Market Rate in Rs.
Wheat	25
Mustard	80
Paddy	20
Maize	30
Pulses	100
Vegetable(average rate)	25

Annex V

Average Crop Yield Per Kattha

Name of Crop	Expected Yield Per Kattha
Wheat	90
Mustard	25
Paddy	110
Maize	70
Pulses	18
Vegetable	60