

CASE STUDIES ON CLIMATE-HUMAN WILDLIFE CONFLICT NEXUS IN BRAHMADEV-LALJHADI COMPLEX OF WESTERN NEPAL



© Muna Thapa WWF Nepal



Supported by:
 Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

based on a decision of
the German Bundestag



Case studies on Climate-Human Wildlife Conflict Nexus in Brahmadev-Laljhadi Complex of Western Nepal

Contributors

Arati Khadgi, WWF Nepal

Rubina Karki, WWF Nepal

Lakshya Training and Research Centre Pvt. Ltd.

Alpine Consultancy Pvt. Ltd.

Reviewer

Dr. Shashank Poudel, WWF Nepal

Design

Water communication

© WWF Nepal, 2025

About the Booklet

The booklet presents three unique case studies exploring the dynamic interplay between climate change and human-wildlife conflict in Brahmadev-Lajhadi complex of Western Nepal. It highlights the challenges faced by three villages in the complex affected by the dual pressure leading to livestock depredation, crop raiding and human casualties.



INTRODUCTION

Climate change is emerging as an active driver of degradation of freshwater and forests ecosystem impacting wildlife and people dependent on it¹. Increasing climate variability is resulting in water scarcity, higher incidences of forest fires from prolonged dry spells as well as increased floods and landslides². These changes not only threaten biodiversity, but also diminish the availability of natural resources, disrupting ecosystem services that are vital for rural livelihoods. With the shrinking of available space and resources, competition between people and wildlife is bound to aggravate in future³ affecting more to the residents living close to forest fringes that are habitat to wildlife⁴.

Climate change intensifies human-wildlife conflict (HWC) by magnifying resource scarcity, changing behaviors and distributions of both humans and animals, and heightening the frequency of human-wildlife encounters⁵. Understanding how climate change influences these dynamics is essential for

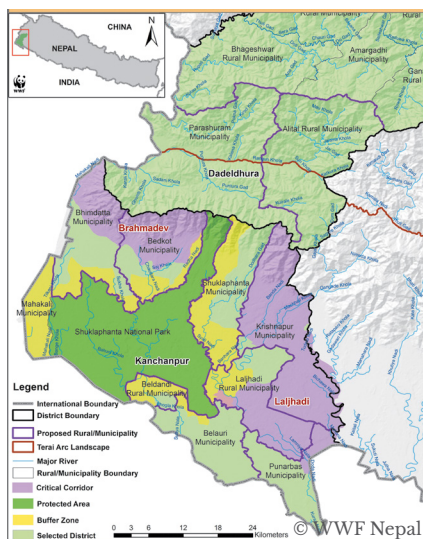
developing effective strategies to address HWC. As climate change reshapes resource availability in nature and hinders the flow of ecosystem services both human and animal are dependent upon, Ecosystem based Adaptation (EbA) will be key to avoiding the possible HWC. Without understanding the climate-conflict nexus, investing in mitigation of HWC can be ineffective and unsustainable in the long run. This also includes understanding the outcomes of such interactions and identifying opportunities of coexistence.

The three distinct case studies in this booklet aim to provide ground-level insights into the climate-conflict nexus, capturing lived experiences from the communities, with a focus on Brahmadev-Laljhadi complex of Western Nepal. Exploring the concerns of the local communities, the booklet highlights the urgent need for climate-responsive approaches to reducing HWC and vice versa for coexistence in changing climatic conditions.

-
1. Upadhyay, R. K. (2020). Markers for global climate change and its impact on social, biological and ecological systems: A review. *American Journal of Climate Change*, 9(03), 159.
 2. Bhatt, R. P. (2020). Consequences of Climate Change Impacts and Implications on Ecosystem and Biodiversity; Impacts of Developmental Projects and Mitigation Strategy in Nepal.
 3. Nyhus, P. J. (2016). Human-wildlife conflict and coexistence. *Annual Review of Environment and Resources*, 41, 143-171.
 4. Shrestha, R. (2007). *A case study on human-wildlife conflict in Nepal*. WWF Nepal.
 5. Abrahms, B., Carter, N. H., Clark-Wolf, T. J., Gaynor, K. M., Johansson, E., McInturff, A., Anna C. N., Rafiq, K., & West, L. (2023). Climate change as a global amplifier of human-wildlife conflict. *Nature Climate Change*, 13(3), 224-234.
-

STUDY AREA

The Brahmadev-Laljhadi complex, covering 82,032-hectare area is a critical biodiversity hotspot of Sudur Paschim Province identified as “highly vulnerable” to various hazards such as epidemics, fires, floods, and landslides under both Representative Concentration Pathways (RCP)* 4.5 and 8.5 climate scenarios⁶. Spanning across the Kanchanpur and parts of the Dadeldhura districts within the province, this complex is part of the Terai Arc Landscape (TAL) that extends from Nepal into India, forming a crucial habitat corridor connecting multiple protected areas across both countries. Ecologically, the Brahmadev Laljhadi complex features a diverse range of habitats, including tropical forests, grasslands, wetlands, and riverine ecosystems and links Shuklaphanta National Park (SNP) in Nepal with India's Dudhwa Tiger Reserve, thereby supporting the movement of key species such as tigers



Map of Brahmadev-Laljhadi complex incorporating municipal units.

(*Panthera tigris*), elephants (*Elephas maximus*), and other large mammals. It encompasses 10 municipal units, namely Bedkot municipality, Krishnapur municipality, Laljhadi

6. MoFE. (2021). *Vulnerability and risk assessment and identifying adaptation options: Summary for policy makers*. Ministry of Forests and Environment, Government of Nepal.

*RCP: Representative Concentration Pathways (RCPs) are climate change scenarios to project future greenhouse gas concentrations and possible reductions in atmospheric concentration throughout this century.

rural municipality (RM), Beldandi RM, Bhimdutta municipality, Belaury municipality, Punarbas municipality, and Shuklaphanta municipality in Kanchanpur district, as well as Parashuram municipality and Alital RM in Dadeldhura district.

The complex is experiencing biodiversity loss, ecosystem changes, and degradation of natural resources due to climate change, posing a significant threat to rural livelihoods of the local and indigenous Rana Tharu and Tharu communities reliant on ecosystem services. Future climate change is expected to further deteriorate and transform forested areas, leading to reduced access to essential resources such as food, fuelwood, and water, potentially driving communities to encroach on wildlife habitats. Kanchanpur is identified as one of the most vulnerable districts in the province and falls within the climate-related “disaster hotspots” in Nepal⁷. The temperature of the district rises as high as 43°C and falls as low as 3°C. Analysis of long-term climatic data (from 1981 to 2019) of Kanchanpur District shows that the normal annual maximum temperature is 17.7°C and minimum temperature is 5.9°C⁸. The normal annual average

precipitation is 16550 mm. The analysis shows that the temperature shows an overall annual positive trend of 0.018°C. Likewise, the precipitation shows an increasing annual trend of 5.23 mm/yr. High intensity rainfall with short duration, shifting of rainfall period and erratic rainfall patterns are reported in the area. Considering the extreme climate indices, Kanchanpur district has growing trends of the number of rainy days, very wet days, warm days, warm spell duration, warm nights, cool nights and cold spell durations while no change has been observed in counter indicators.

To better understand the climate-HWC nexus, three villages within the buffer zone of SNP and lying near the corridors were selected for comprehensive case studies based on a detailed vulnerability assessment and mapping of the Brahmadev-Laljhadi complex:

Hattithala, Bedkot Municipality-01, Kanchanpur

Sikalpatti Jai, Laljhadi Rural Municipality-04, Kanchanpur

Tilkipatti, Shuklaphanta Municipality-12, Kanchanpur

7. MoFE. (2021). *Vulnerability and risk assessment and identifying adaptation options: Summary for policy makers*. Ministry of Forests and Environment, Government of Nepal.

8. DHM (2017). *Observed climate trend analysis in the districts and physiographic regions of Nepal (1971-2014)*. Department of Hydrology and Meteorology, Government of Nepal.

METHODOLOGY

Data Collection for Identification of Hotspot for Climate and HWC

The ward level climate change vulnerability assessment information was extracted from the Local Adaptation Plan of Action (LAPA) and Local Disaster and Climate Resilience Plans (LDCRP) of municipalities.

The information on HWC was obtained from the Human wildlife conflict relief distribution data and reports available from SNP, National Trust for Nature Conservation, published scientific research papers and articles on HWC conflict in the area.

Summary of climate-HWC status in each municipal unit of Brahmadev-Laljhadi complex

SN	Blocks	Municipality (M)/ Rural Municipality (RM)	Ward-wise vulnerability ranking	
			V1 (Very High)	V2 (High)
1	Northern Part of SNP	Aalital RM	1 & 8	3 & 5
2		Parshuram M	3,11 & 6	8,7 & 2
3		Bedkot M	1,4,5 &10	2 & 3
4		Bhimdatta M	9,11,12,13 &19	1,2,3,5 &18
5	Southern Part of SNP	Beldandi RM	5	1,2 & 3
6		Belauri M	1,2,5 & 9	6,8 & 10
7		Punarbans M	5,7,8,9 & 11	2 & 6
8		Laljhadi RM	1,2 &4	3
9	East Part of SNP	Krishnapur M	4 & 7	1 & 2
10		Suklaphanta M	7,8,9 &12	2,6 &11

Selection of Sites

The complex was divided into 3 blocks: northern part of the SNP covering Alital, Parshuram, Bedkot, Bhimdatta; municipal units of the southern part of SNP: Beldadi, Belauri, Punarbas, Laljhadi; and east to SNP: Shulaphata and Krishnapur. A ward level climate change vulnerability assessment results were overlaid with the data

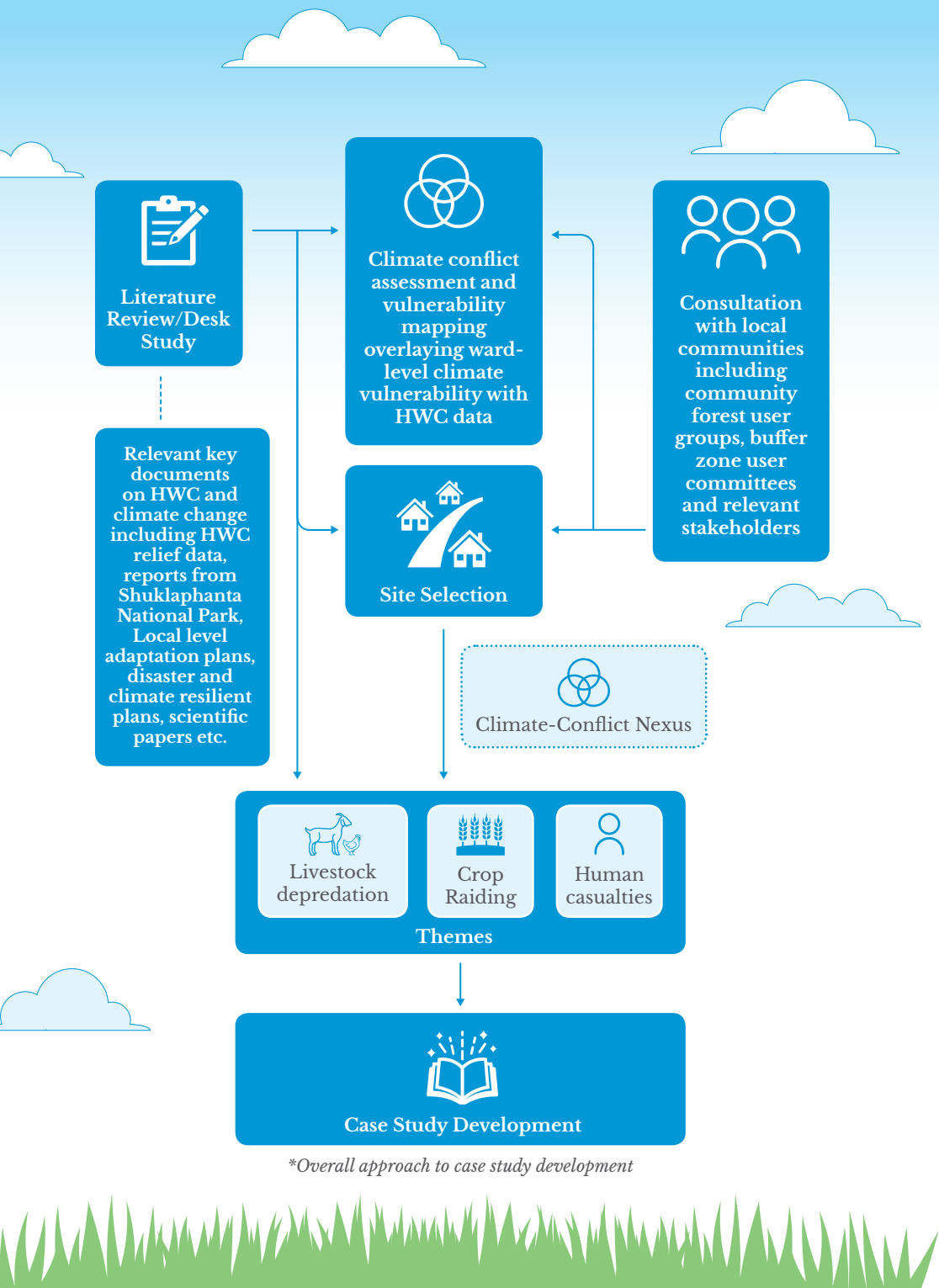
on the incidences of human wildlife conflict. The ward with very high vulnerability and that had recorded incidences of HWC was then selected from each block. As a result, Bedkot municipality- ward 1, Laljhadi Rural Municipality-ward 4 and Shuklaphanta Municipality- ward 12 were selected for the development of the climate-conflict nexus.



Consultation to understand ground context.

Ward-wise vulnerability ranking		Ward overlapping Climate Vulnerability and HWC	Selection of Climate-Conflict Hotspot Ward
V3 (Medium)	V4 (Low)		
2 & 6	4 & 7		
9,10 & 1	4,5 & 12		
6 & 7	8 & 9	1, 10	1
6,7,8,10 & 15	4,14,16 & 17	14, 15, 18. 19	
4	2	2	
3 & 7	4	9	
1 & 10	3 & 4		
5	6	4	4
5,6 & 9	3 & 8		
3,5 & 10	1 & 4	5, 12	12

(Source: LAPA, LDCRP, Field Consultations)



CASES

CASES



© WWF Nepal

Vast area of agricultural land turned to river bank.

CASE 1

DISPLACEMENT AND FEAR

 Hattithala village, Bedkot
Municipality-01, Kanchanpur

Site Context

Hattithala Village is located in the northern section of Brahmadev-Laljhadi complex, at the foothills of Churia hills and in close proximity to Brahmadev Corridor. The village is bordered by the Radha River to the east and Patthariya River to the west.

Hattithala, a small village near Brahmadev corridor, is facing increasing livestock depredation due to leopards approaching human settlement areas. The villagers of Hattithala perceive that water scarcity and prolonged dry spells have reduced herbivore population like deer in the surrounding forest areas. In search of food, leopards enter the village, tempted by docile domestic goats. Likewise, rising flood occurrences and deforestation have pushed the village closer to the edge of the forest area, near to Shuklaphanta National Park increasing the risk of wildlife encounters.



© WWF Nepal

The premises of Hattithala.

The village is home to *Tharu* and *Ranatharu* Indigenous groups, with approximately 70% relying on subsistence agriculture and livestock farming while, others engage as daily wage earners, operate small business etc. Livestock farming is an important livelihood in Hattithala with cows, buffaloes and goats found in nearly every household. Women are primarily responsible for tasks such as fodder collection, grazing and overall care of the livestock.

Climate-Conflict Nexus

Hattithala has witnessed increasing climate variability in recent years including prolonged dry spells particularly during critical agricultural seasons and erratic, high-intensity rainfall during monsoon season. Situated at the foothills of Chure hills and surrounded by rivers originating from these hills, the village is constantly threatened by riverbank erosion along the Radha, Patthariya and Dheditum rivers.

In addition to the challenges posed by the impacts of climate change, Hattithala is also experiencing an alarming rise in human wildlife conflict. Wild animals from the nearby forest areas increasingly venture into the village, primarily in search of food and water.



Goat killed by wildlife attack (common Leopard) as documented in the local ward office.

“My wife had loaned some money from the cooperatives and added few goats in our pen. Looking after these goats were part of our daily activities. Unfortunately, one morning in last February, I woke up to a sight of one goat killed right outside the pen. We lost another couple of months ago. The leopards came in for a hunt. They were tempted by the view of docile prey like the goat to come back again and again.”

- **Jaisingh Dhami**
a local resident of Hattithala

The villagers of Hattithala report that herbivores such as wild boars (*Sus scrofa*), elephants, blue bulls (*Boselaphus tragocamelus*), spotted deer (*Axis axis*), rhesus monkeys (*Macaca mulatta*) frequently raid the agricultural fields, given their close proximity to the fringe of Baijanath community forest. The local people perceive the presence of these animals in their fields as a consequence of the scarcity of palatable grass for herbivores and sufficient water bodies owing to prolonged dry spell. Crop depredation, particularly for paddy cultivation, has been reported to be sustaining significant damage each year. The entry of these herbivores has also attracted carnivores into the village premises, which prey on both wildlife and domestic livestock. The loss of 5-10 livestock has been reported annually, primarily goats, cows and poultry. Over the last two years, a total of 164 conflict cases have been reported with at least 15 cases related to leopard attacks on livestock and the rest involving crop depredation.

However, human-wildlife interactions may not be solely driven by wildlife movement in Hattithala. Climate-induced hazards, flooding in particular, have forced the villages to move closer and closer to the forest areas, increasing their exposure to wildlife. Most recently, flooding from the Dhedhithum river displaced four households, forcing them to resettle near Baijanath Community Forest, which borders the lower edge of the Brahmadev Corridor. Therefore, there seems to be an interplay of the human wildlife conflict which is further exacerbated by the increasing impacts of climate change. The average size of land holding of each household in the village is inadequate to sustain year-round food security. Frequent crop raiding and livestock depredation, prolonged dry spells and flooding have further intensified the hardships faced by the people of Hattithala, exposing them to food insecurity and worsening economic conditions.

CASE 2

HARVESTS AT RISK



Sikalpatti Jai, Laljhadi Rural
Municipality-04, Kanchanpur

Site Context

Sikalpatti Jai is an isolated village encircled by Banara River to the north, Dodha River to the east, Syali River to the west and the confluence of Syali and Dodha River to the south. The village is located between the Laljhadi corridor and Shuklaphanta National Park. The village is predominantly inhabited by Indigenous *Rana Tharu* and *Tharu* communities with majority of the people engaged in agriculture, followed by construction, small businesses and manufacturing.

In Sikalpatti Jai, wildlife entering agricultural fields has become a common occurrence, causing extensive damage to the crops and land along. Wild animals such as elephants and spotted deer rampage mainly from September to November during the crop harvesting season, as resources in the forests of Laljhadi corridor and Shuklaphanta National Park become scarce in the forest owing to prolonged dry spells.



The premises of Sikalpatti Jai.

Subsistence farming is practiced by majority of the villagers, including paddy, wheat along with sugarcane, peanut, banana, watermelon etc. while livestock rearing comprises of cows, buffaloes and goats with the average household production sufficient only for 3 to 6 months.



Agricultural farm located in one of the villages of Brahmadev-Laljhadi complex.

Climate-Conflict Nexus

Sikalpatti Jai experiences increasingly erratic and intense rainfall, with shifting seasonal patterns in both summer and winter. Due to its geographic location, which is surrounded by rivers on all sides, the village is highly susceptible to flooding. Recently, unexpected and unseasonal heavy rainfall inundated large portions of agricultural land and village settlements, and flooding events have swept away portions of agricultural lands. The entire settlement had shifted to the current location from the bank of the Syali River in the year 1997.

“We could harvest paddy equivalent to only 0.06 hectares of land among the 0.54 hectares cultivated. Elephants coming from both sides raided on most of the farmland.”

- **Padam Singh Karki**
local resident of Sikalpatti Jai

In addition to bearing the brunt of climate change, wildlife from Shuklaphanta National Park, Laljhadi corridor and nearby community forests frequently enter the agricultural fields. Crop damage by elephants has been reported to be particularly destructive, with at least 34 incidents recorded over the past two years. Other wildlife including wild boars, spotted deer, and blue bulls was also reported for foraging into agricultural fields.

The villagers perceive that their close proximity to the national park and corridor has increased wildlife presence, while prolonged dry spells in the forest areas have pushed the wildlife to their village for water availability. In addition, the forest floors are being replaced by shrubs which may be unpalatable to these herbivores, further pushing them into human settlements in search of water, food and even alternative migration routes. The increasing HWC in the village is deeply interconnected with climate change, creating a cycle of habitat degradation, resource scarcity and heightened interactions between wildlife and local communities.

The villagers perceive that their close proximity to the national park and corridor has increased wildlife presence, while prolonged dry spells in the forest areas have pushed the wildlife to their village for water availability. In addition, the forest floors are being replaced by shrubs which may be unpalatable to these herbivores, further pushing them into human settlements in search of water, food and even alternative migration routes. The increasing HWC in the village is deeply interconnected with climate change, creating a cycle of habitat degradation, resource scarcity and heightened interactions between wildlife and local communities.

CASE 3

HUMAN CASUALTIES



Tilkipatti, Shuklaphanta
Municipality-12, Kanchanpur

Site Context

Tilkipatti is nestled at the confluence of the Banara and Dodha Rivers, between the Laljhadi Forest and Shuklaphanta National Park.

The community in Tilkipatti is composed of Ranatharu people along with Chhetri and Dalit groups. For the majority of the people (70.7%) in the village, agriculture is the primary livelihood source along with their engagement in construction, small business and manufacturing. Agriculture is focused on two cropping cycles, primarily cultivating paddy and wheat along with cash crops such as sugarcane, peanuts and watermelons. Livestock rearing, particularly of buffaloes and goats, is also common.

Climate-Conflict Nexus

Tilkipatti has experienced an increase in high-intensity rainfall with subsequent flooding in recent years. This has also resulted in severe riverbank erosion. Consequently, more than 20 families have been displaced due to flooding. It is likely

Tilkipatti bears the tragic toll of human-wildlife conflict with wild animals such as elephants entering the village. Tragically, the village has witnessed three **human casualties** in incidents involving elephant attacks. Residents often risk their lives defending crops during peak harvest season from September to February when the food is scarce in the nearby forest areas. The separation of two proximate habitats, Shuklaphanta National Park and Laljhadi Forest by human settlements such as in Tilkipatti has disrupted the natural connectivity, primarily driven by efforts to accommodate flood victims of the area.

that Banara River, which previously flowed into Syali river has altered its course, now draining directly into Dodha river, which has led to increased volume and flow of water and has intensified erosion along its bank, shrinking Tilkipatti settlement and making it more vulnerable to flooding.



Agricultural land turned into riverbank.

The village's placement between two rich wildlife forest areas, i.e. Laljhadi forest and Shuklaphanta National Park has exposed it to herbivores such as elephants, wild boars and blue bulls which cause significant crops damage in the agricultural lands. Further, the village has witnessed three human casualties in the past two years, resulting from elephant attacks.

The displacement of the villagers nearby the forest areas has also disrupted natural connectivity exposing wildlife to human settlements. As a result, the dual pressures of climate change and escalating human wildlife conflict is apparent in the area. Thus, it is imperative to incorporate an integrated approach that addresses both concerns for the wellbeing of both people and nature.

“While I was trying to protect my field from the elephants, they came out and just attacked me. The elephants usually come into our fields during the harvest season; it is recurrent. Maybe because they do not have much food source in forests and that we are an easy target.”

- **Gopal Singh Airi**
a local resident from Tilkipatti

The project, “**Mitigating Human-Wildlife Conflicts through EbA in Nepal**” is a three-year project that aims to fill the knowledge gap in the climate-conflict nexus by exploring the pathways on how communities and wildlife respond to the impacts of climate change resulting in negative interactions and recommend ecosystem-based adaptation (EbA) measures for the widest range of local contexts against climate adversities. It focuses on developing a framework on the nexus backed up by case studies, identify EbA interventions and improve the capacity of duty bearers to translate knowledge into actions. Commenced in 2024, the project is funded by the Global EbA fund and implemented in Nepal by WWF Nepal.



For more information about the project
Contact: info@wwfnepal.org



Supported by:



Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

Based on a decision of
the German Bundestag



INTERNATIONAL
CLIMATE
INITIATIVE

