



Human-Wildlife Conflict Management

Conflict to Coexistence (C2C) Strategy for
Sampheling Gewog, Chhukha (2025-2029)



Divisional Forest Office-Gedu
Department of Forests and Park Services
Ministry of Energy and Natural Resources



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Abbreviations

BSMPL	Bhutan Silicon Metal Private Limited
CF	Community Forest
CFO	Chief Forestry Officer
C2C	Conflict to Coexistence
DoA	Department of Agriculture
DoFPS	Department of Forest and Park Services
DoL	Department of Livestock
DFO	Divisional Forest Office
FMID	Forest Monitoring and Information Division
GAO	Gewog Administrative Officer
HWC	Human Wildlife Conflict
NCD	Nature Conservation Division
RGoB	Royal Government of Bhutan
RBP	Royal Bhutan Police
WWF	World Wildlife Fund



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Royal Government of Bhutan
Ministry of Energy and Natural Resources
Department of Forests and Park Services
Thimphu: Bhutan



Foreword



Human-Wildlife Conflict (HWC) remains a major challenge for conservation and rural livelihoods in Bhutan, particularly in forest-dependent communities like Sampheling Gewog. As pressures from climate change and development increase, promoting coexistence between people and wildlife has become more urgent than ever.

The Conflict to Coexistence (C2C) Strategy for Sampheling Gewog (2025-2029) is a timely, community-driven response developed through field assessments and consultations

across all chiwogs. It focuses on reducing conflict with key species while strengthening livelihoods, protecting habitats, and enabling wildlife to thrive alongside communities through prevention, mitigation, and strong local participation.

With the support of the IKI-WWF Project, "Living Landscapes: Securing High Conservation Values in South-Western Bhutan," and close collaboration with local governments and partners, this Strategy provides a practical roadmap for sustainable coexistence. I extend my sincere appreciation to the communities of Sampheling Gewog and the DFO Gedu team for their dedication and stewardship in driving this important initiative forward. The Department of Forests and Park Services remains fully committed to its implementation to safeguard both biodiversity and community well-being for generations to come.

(Karma Tenzin)
Director

Acknowledgement

The C2C strategy for Sampheling Gewog is the result of a collective and dedicated effort by the staff of the Divisional Forest Office, Gedu. The Division sincerely acknowledges the commitment, professionalism, and teamwork demonstrated by all officers and staff who contributed their time, experience, and technical inputs toward the successful formulation of this strategy. Their sustained engagement throughout the process ensured that the document is comprehensive, practical, and grounded in field realities.

The formulation of this strategy was made possible through the unwavering support and guidance of the Department and WWF, Bhutan. The Division is deeply grateful for their strategic direction, technical advice, and continuous encouragement. The Division further expresses its sincere gratitude to the IKI Project, “Living Landscapes: Securing High Conservation Values in South-Western Bhutan,” for its generous financial support, which enabled the conduct of comprehensive socio-economic and field surveys. The data generated through these assessments formed a critical foundation for evidence-based planning and significantly informed the management interventions contained in this strategy. WWF–Bhutan, together with the Project Coordination Unit, played a pivotal role in facilitating the timely procurement of essential equipment and field gear, and in delivering capacity-building programs. These interventions greatly strengthened the technical capacity of the field teams involved in the assessment.

The Division would like to extend special appreciation to Mr. Yeshe Gyeltshen of DFO, Gedu, who played a crucial leadership role in guiding and coordinating the formulation of this strategy. His dedication, technical oversight, and leadership were instrumental in bringing the C2C planning process to completion. Finally, the Division extends its heartfelt thanks to all individuals, institutions, and stakeholders who, in various capacities, contributed to the development of this strategy. Their collective efforts have resulted in a key milestone that will guide Human Wildlife Conflict management and their co-existence in Sampheling Gewog in the years to come.

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1. Introduction

Bhutan is internationally acclaimed for its dedication to environmental conservation, with its Constitution requiring that a minimum of 60% of the country's land area remains under forest cover for all time. The 2023 State of Forest Report (National Forest Inventory) indicates that Bhutan's forest cover is currently 69.71%, or 2.68 million hectares. Chukha Dzongkhag, with 91% forest cover, ranks second among the 20 Dzongkhags, just after Zhemgang Dzongkhag. This biodiverse region is home to numerous renowned species, including the Royal Bengal Tiger, Snow Leopard, Himalayan Musk Deer, Red Panda, Wild dog, White-bellied Heron, and Golden mahseer. The flourishing wildlife population in the biodiverse Chukha Dzongkhag has led to a rise in human-wildlife conflicts (HWC), as animals increasingly encroach upon human settlements. This situation presents significant challenges for both conservation efforts and local livelihoods.

The Divisional Forest Office in Gedu oversees approximately 1,991 km², covering all 11 Gewogs within Chukha Dzongkhag. This office provides essential forestry services with a mandate to support conservation efforts and address HWC, a pressing national concern impacting communities at multiple levels. HWC is prevalent across nearly all Dzongkhags, with Human-Elephant Conflict particularly severe in the southern region. For years, elephants have caused significant economic losses and heightened social pressures on farmers in Southern Bhutan by frequently damaging crops and property (Divisional Forest Office Sarpang, 2017). Similar challenges are observed in Sampheling Gewog, where elephants are a primary conflict species.

To address such challenges, the Conflict to Coexistence (C2C) approach offers a structured framework aimed at enabling systematic planning, implementation, and monitoring of HWC management. This approach provides a step-by-step guide that balances long-term and short-term solutions, adaptable to various regions and contexts. Built on four key principles-maintaining tolerance, sharing responsibility, building resilience, and adopting a holistic perspective-the framework guides the application of six inter-connected HWC management elements: policy, prevention, response, mitigation, monitoring, and understanding the interactions between people, wildlife, habitat, and assets. These elements must be implemented in a coordinated and integrated manner, with each one reinforcing the others to achieve effective HWC management outcomes. This structured approach helps the Divisional Forest Office address HWC more systematically in regions like Sampheling Gewog, where HWC is a persistent challenge.

2. Goal and Objectives

Goal: “To ensure harmonious co-existence between wildlife and people through holistic approach”.

Objectives:

1. Safeguard people and their livelihood/assets alongside wildlife presence.
2. Secure wildlife and its habitat to sustain a healthy and resilient wildlife population.

3. Methodology

3.1. Site Description

Sampheling Gewog, one of the eleven gewogs under the Chukha Dzongkhag administration, is centered in Allay, about 15 kilometers from Phuentsholing town. Covering an area of 140 square kilometers, the gewog comprises of 531 households with a population of 4,077, resulting in a population density of 55.09 people per square kilometer. The demographic includes 2,106 males and 1,971 females, with the majority (2,811) in the working-age group of 15–64 years, 1,036 individuals under 14 years, and 230 aged 65 and above. The community is ethnically diverse, with groups such as the Sharma, Rai, Gurung, Limbu, Tamang, and Chettri, and has a poverty rate of 20.22%. The gewog raises livestock, including goats, cows, and poultry, and grows cash crops such as paddy, cardamom, orange, and areca-nut.

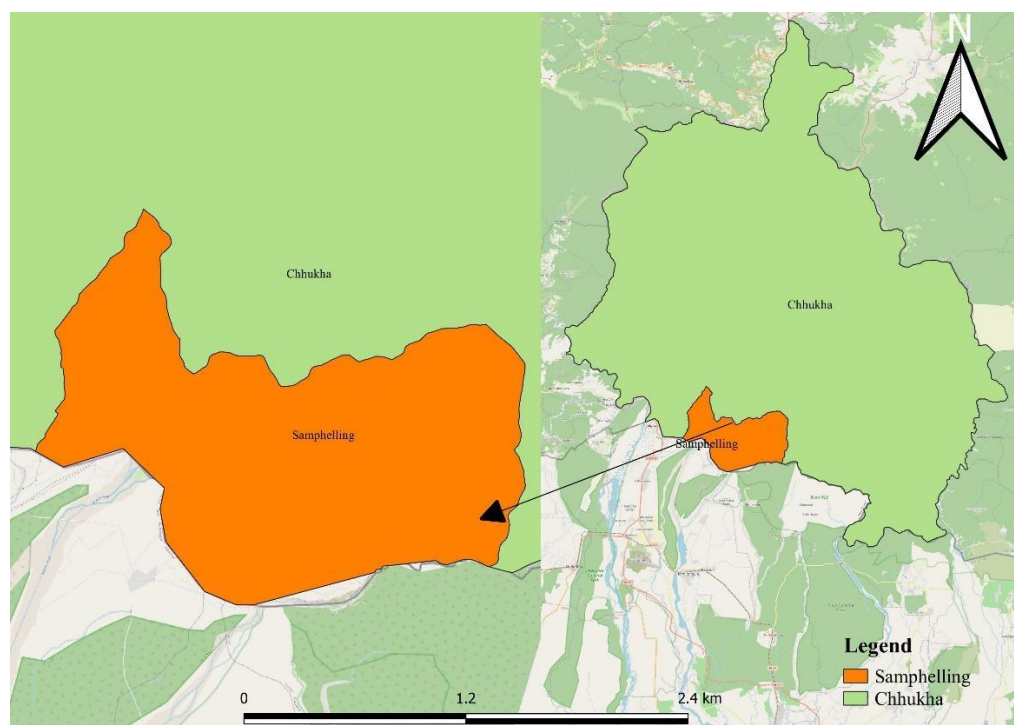


Figure 1: Location Figure 1: Location map of Sampheling Gewog

3.2. Methods

This strategy is entrenched in the principles and methodologies of the Conflict to Coexistence approach, an integrated and structured framework that offers a systematic guide for planning, implementing, and monitoring HWC management. The C2C approach highlights core principles, including holistic planning, resilience-building, shared responsibility, and fostering tolerance, all aimed at achieving sustainable coexistence between communities and wildlife. Figure 2 depicts the ongoing implementation of measures designed to address current or emerging HWC issues using the C2C approach from step 1 till step 7. This process involves co-developing a long-term HWC management strategy in collaboration with communities and other stakeholders. The approach emphasizes the importance of implementing short-term or sustained interventions to effectively respond to or manage urgent HWC situations. Simultaneously, it prioritizes fostering and maintaining trust among stakeholders throughout the process. By addressing root causes and underlying issues, the C2C approach aims to develop a comprehensive and sustainable HWC management plan for long-term success.

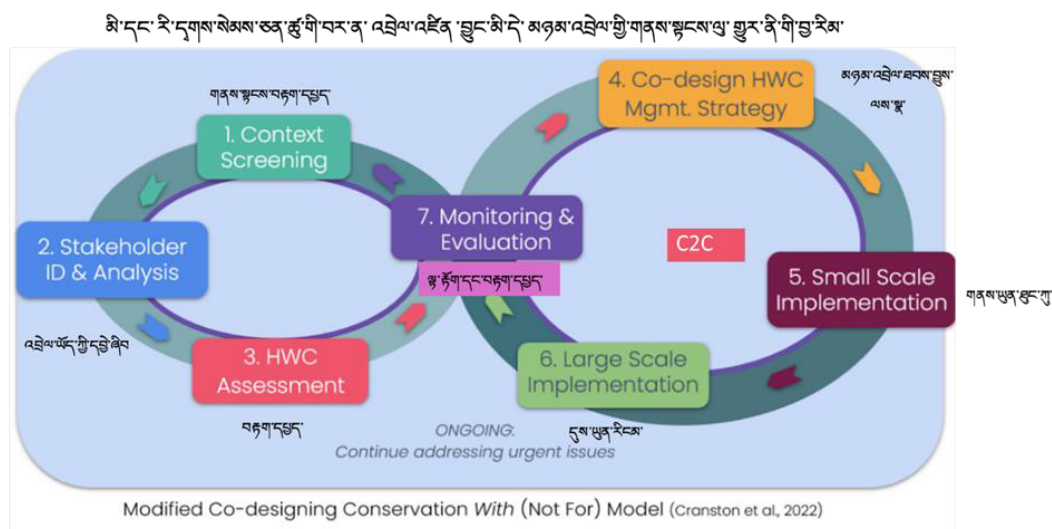


Figure 2: C2C Framework

3.2.1. Context Screening

Context screening is foundational for designing effective, locally relevant HWC Interventions in an area. As the initial phase of the assessment process, it focuses on identifying and analyzing detailed aspects of the landscape and the prevailing HWC situation, leading to solutions that are suitable for both community and environment. In collaboration with Sampheling gewog administration and RNR Extension office, baseline information about site description (i.e., information on the landscape, human demographics, and livelihoods), trends in human-wildlife conflict (i.e., records of conflict

species, frequency/severity of conflict, types of conflict, and management interventions), drivers of human-wildlife conflict (i.e., both anthropogenic and natural drivers), wildlife dynamics (i.e., trends in conflict and prey species, movement of species through the landscape, and factors that drive conflict), and policies were gathered. This was mainly done through reviewing relevant literature and available reports.

3.2.2. Stakeholder Identification and Analysis

Stakeholders are individuals or group of people with an interest or “stake” in the management of HWC in the gewog. Some are directly impacted by HWC, while others are involved in its management. Additionally, some stakeholders are not directly affected but are highly influential. For the C2C approach, it is crucial to understand the stakeholders involved in human-wildlife conflict and their collaborative potential. Therefore, a core team consisting of comprising the Chief Forestry Officer, relevant officials from DFO, local government officials, Gewog Agriculture and Livestock Extension Supervisors, and Tshogpas from five Chiwogs was constituted. The team conducted stakeholder identification and analysis using the Stakeholder Analysis Matrix, which involves clustering stakeholders (Table 1). This matrix employs a systematic evaluation process by answering a series of questions on a scale of 1 to 5, focusing on the following aspects:

Interest in HWC and its management in this landscape (Sampheling gewog): 1= Not at all interested to 5= Very interested.

Influence on long-term success of a HWC management strategy: 1= No influence to 5= High influence.

Availability to participate in the co-design of a HWC management strategy: 1= Not at all available to participate to 5= Frequently available to participate.

Table 1: Stakeholder Analysis Matrix for Sampheling Gewog

Stakeholder Interest-Influence Chart			
Stakeholder	Interest	Influence	Category
GAO	5	5	High Interest, High Influence
Tshogpa	5	5	High Interest, High Influence
CF	4	4	Some Interest, Some Influence
BSMPL	3	2	Neutral, Low Influence
Livestock	5	5	High Interest, High Influence
RBP	4	5	Some Interest, High Influence

Note: Interest (1 = Not at all interested, 2 = Not very interested, 3 = Neutral, 4 = Interested, 5 = Very interested) **Influence** (1 = No influence, 2 = Low influence, 3 = Medium influence, 4 = Some influence, 5 = High influence)

The stakeholder analysis reveals a spectrum of interest and influence among the groups engaged in the HWC management strategy. Those with both

high interest and high influence, such as Gewog Administrative Officers (GAOs), Livestock officials, and Tshogpas, are instrumental in driving the strategy forward through active participation and leadership. Stakeholders with medium influence, including members of the Community Forest (CF) group, play a vital role in managing resources and fostering collaboration. Bhutan Silicon Metal Private Limited (BSMPL), while moderately interested, has relatively low influence but can contribute through specific, focused interventions. The Royal Bhutan Police (RBP), with high influence but slightly less interest, are key to maintaining safety and ensuring regulatory compliance, thereby adding a strategic dimension to the initiative. The (Table 1) provides a clear visualization of these dynamics, helping to identify and leverage the strengths of each stakeholder group to achieve the long-term goals of the HWC management.

3.2.3. HWC Assessment

The C2C HWC assessment is organized into three sets of questions, each designed for different stakeholder groups:

C2C Project Manager (Yes/No)

Duty Bearers/Service Providers (Likert Scale 1=Strongly disagree, 5=Strongly agree)

Community Members (Likert Scale 1=Strongly disagree, 5=Strongly agree)

This approach ensures a comprehensive understanding of diverse perspectives from different stakeholder groups and how their opinions align or differ across various elements and outcomes. Each set of questions addresses the six key elements – Policy, Prevention, Response, Understanding the Conflict, Mitigation, and Monitoring – under each of the four outcomes: People, Livelihoods/Assets, Habitat, and Wildlife. The questions for the C2C Project Manager consist of a series of Yes/No inquiries aimed at understanding the context of the HWC situation within the landscape. The questions for Duty Bearers/Service Providers focus on assessing the effectiveness and compliance with policies and programs designed to reduce HWC. These are evaluated using a Likert scale between 1 (strongly disagree) – 5 (strongly agree), allowing for an understanding of differences in opinions within and among stakeholder sub-groups. The questions for Community Members explore their perspective on HWC within the landscape, their awareness on its impacts, and their opinions on the effectiveness and usefulness of various policies and programs in addressing the conflict. These are also rated on a Likert scale between 1 (strongly disagree) – 5 (strongly agree) gauge agreement with the statements.

From May 18 to June 7, 2024, following training and a pre-test of the household survey, one-to-one enumerations (household interview) were conducted in each chiwog. The survey included one project manager, 18 service providers/

duty bearers and 232 community, based on sample size determined by Yamane's (1967) method at 95% Confidence Interval.

$$n = \frac{N}{1+Ne^2},$$

Where n = Sample size; N = Total Population/HHs in the gewog; e = level of precision (e.g., margin of error, commonly 5% or 0.05 for 95% confidence level). The total household in the study area from five chiwog is about 531 households for Sampheling (sampling frame). Therefore, the sampling size for the survey was 232 households for Sampheling Gewog, which was further determined for every chiwog for the survey. Efforts were undertaken to alternate between male and female respondents to reduce gender bias in the sampling process.

Chiwog level Sample size selection

After determining the total sample size for the gewog, the sample is proportionally distributed among chiwogs based on their household size. This ensures fair representation.

The proportional allocation formula is:

$$n_i = \frac{N_i}{N} \times n$$

Where:

n_i = Sample size for a specific chiwog

N_i = Population of that chiwog

N = Total gewog households

n = total calculated sample size for the gewog

This approach ensures statistically reliable and proportionally representative sampling at both gewog and chiwog levels.

Selection of Households for Interview

In each chiwog, a complete list of households (sampling unit) is prepared and numbered sequentially (e.g., 1 to N). From this list, interview households are selected using systematic random sampling combined with random number generation to ensure fairness and to avoid bias and cluster selection. First, generate a random starting number using the Random Number Generator; this random number becomes the first selected household. For the remaining household selections, subsequent households are selected by adding the sampling interval (x) to the starting number.

This process continues until the required sample size (n) is reached.

This method ensures that every household has an equal and independent chance of selection, thereby minimizing selection bias and cluster effects while maintaining statistical reliability.

3.2.4. Co-design

To co-design the C2C strategy, a consultation workshop was held with local communities and key stakeholders in every chiwog from 21-23 October, 2024. The development of the HWC management strategy was adopted through a participatory approach. This inclusive process ensured that the strategies were closely aligned with the needs and perspectives of the local communities.

A total of 208 community members participated in these consultation meetings, comprising 26.92% (n = 56) female and 73.08% (n = 152) male participants (Table 2). Consultations were held in each chiwog to actively involve local communities in shaping the strategy. This inclusive approach provided a platform for participants of both genders to share their concerns, priorities, and insights on human-wildlife conflict within their respective chiwogs. Community members contributed their experiences and challenges, offering valuable grassroots perspectives to inform the strategy development process.

Table 2: Participants from each chiwog during the consultation meeting

Chiwog	Female	Male	Total participants
Pekarling Rinzingling	13	32	45
Khempaithang Sonamthang	8	36	44
Singyegang-Tshogchuna	15	27	42
Pedtshelnang	9	22	31
Gongpogang-Pana	11	35	46
Grand Total	56	152	208
%	26.92%	73.08 %	100.00 %

The findings from the C2C assessment were shared during the consultation meetings, fostering transparent dialogue and enabling community members to validate the data against their lived experiences. This exchange provided participants with a clearer understanding of the scale and nature of the issues they face. Drawing on insights from the assessment and feedback from the consultations, community members and the project manager worked collaboratively to design targeted strategies to mitigate HWC. This collaborative approach ensured the strategies were locally relevant and co-owned by the community. The co-design process resulted in the development of comprehensive strategies tailored to address the specific challenges identified by each chiwog.

4. Results and Discussions

4.1. Demographic Information of survey respondents

Understanding the demographic profile of community members was crucial for capturing perspectives from diverse groups within the community, ensuring an inclusive and accurate representation of their experiences and needs. Efforts were made to achieve gender-balanced participation in the survey. Despite these efforts, the final sample comprised 67.24% male respondents ($n = 156$) and 32.76% female respondents ($n = 76$), indicating a higher representation of males. In terms of age distribution, the majority of respondents (43.10%, $n = 100$) were aged 41–60 years, followed by 33.19% ($n = 77$) in the 19–40 age group. Respondents over 60 years accounted for 23.28% ($n = 54$), and one respondent (0.43%, $n = 1$) fell within the 15–18 age group.

Regarding educational background, 62.93% ($n = 146$) of the respondents had no formal education, while 22.87% ($n = 53$) had completed primary education. Additionally, 10.78% ($n = 25$) had secondary education, and 1.72% ($n = 4$) had attended Non-Formal Education (NFE) programs. Only 0.43% ($n = 1$) had tertiary-level education, while 1.29% ($n = 3$) fell under “other” educational categories. The demographic profile highlights that the community largely comprises subsistence farmers dependent on agriculture and livestock farming as their primary means of livelihood and income. Understanding these dynamics is essential for designing effective, targeted interventions for managing HWC in the gewog.

4.2. Overall Result for Sampheling Gewog

4.2.1. Gewog level Conflict Species

In Sampheling gewog, the C2C Project Manager, Service Providers/Duty Bearers and Community Members identified a set of conflict-causing species that pose significant challenges to the communities. As an agrarian society which primarily dependent on agriculture, crop damage by wildlife emerged as the most pressing issue, alongside damages to property and threats to human lives.

Conflict Species Identified by Respondent Categories (Figure 3)

- **C2C Project Manager:** Bear, Dhole, Primates and Rodents
- **Service Providers/Duty Bearers:** Birds, Monitor Lizard, Snakes, Wild Pig, Macaques, Porcupine, Rodents, Elephant, Eagle, Barking Deer, Civet, Leopard Cat, Marten, Tiger, Bear, Leopard, Wild Dog, Rabbit and Sambar
- **Community Members:** Barking Deer, Bear, Birds, Civet, Eagle, Macaques, Marten, Monitor Lizard, Porcupine, Rabbit, Rodents,

Snakes, Wild Pig, Wild Dog, Leopard Cat, Sambar, Wolf, Leopard, Elephant, Tiger, Gaur and Langurs.

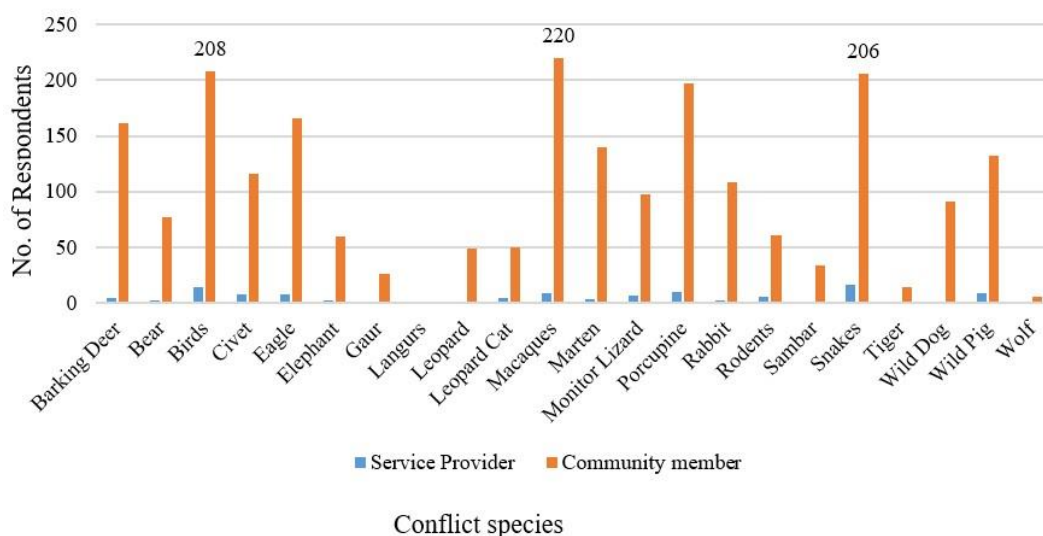


Figure 3: Conflict species in Sampheling gewog

4.2.2. Results by Outcome

The C2C approach for managing HWC has to have positive outcomes across multiple dimensions where, People are Able and Willing to Live Alongside Wildlife which will foster a more harmonious relationship between People and Wildlife. The implementation of interventions will minimize losses from crop damage and livestock predation, securing Livelihoods and Assets. As a result, retaliatory killing, poaching and tolerance level will be high, allowing wildlife to thrive alongside people and human settlements. Furthermore, ensured sufficient natural habitats are secured to support sustainable healthy wildlife populations. The outcomes by addressing these interconnected aspects (people, livelihoods, wildlife, habitat) demonstrated that when people's livelihoods are protected and wildlife is given space to thrive, a sustainable coexistence between humans and wildlife becomes possible, benefiting both communities and ecosystems in the long run.

Table 3: Score under each Outcome by category of respondents

Outcome	C2C Project Manager	Service providers/Duty Bearers	Community Members
People	0.29	3.68	3.46
Livelihoods/Assets	0.39	3.29	2.84
Wildlife	0.56	3.71	3.47
Habitat	0.67	3.34	3.24

Note: C2C Project Manager scores are between 0 and 1, while Service Providers and Community Members scores are between 1 and 5, with 1 **being Strongly Disagree** and 5 being **Strongly Agree**

The lowest score in the C2C approach was recorded in the People outcome, with scores of 0.29 for the Project Manager, 3.29 for Service Providers, and 2.84 for Community Members, particularly under the Livelihoods/Assets outcome (Table 3). As shown in Figure 5, Livelihoods/Assets received the lowest score across all outcomes, as reported by both service providers and community members in Sampheling Gewog. Consequently, interventions aimed at mitigating human-wildlife conflict and fostering coexistence should prioritize the Livelihoods/Assets outcome, followed by Habitat, People, and Wildlife.

4.2.3. Results by Elements

To achieve the four outcomes, six key elements must be considered, and these elements were assessed under each outcome (Figure 4).

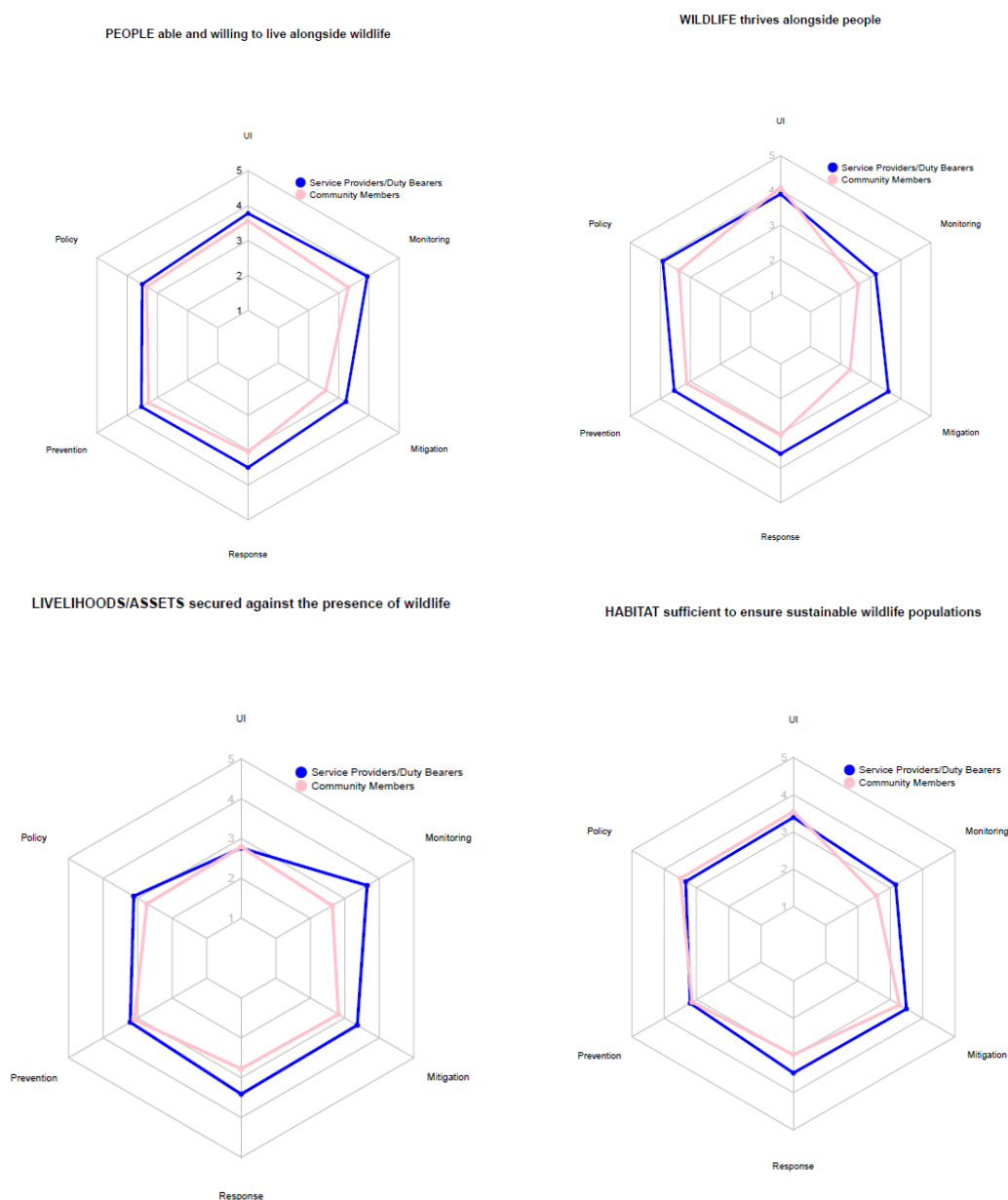


Figure 4: Graphical representation of Results by Elements

The assessment revealed six critical elements that must be considered under each outcome to effectively manage human-wildlife coexistence. The findings are as follows:

1. People Able and Willing to Live Alongside Wildlife:

The lowest score was observed in the mitigation element, highlighting the absence of financial schemes to compensate for losses incurred due to HWC, particularly the loss of crop and human life. Nothing much has been done on mitigation measures in the gewog, which will reduce community tolerance and willingness to live alongside wildlife. This indicates a significant gap in ensuring community resilience and willingness to coexist with wildlife, leading to increased conflict.

2. Livelihoods/Assets Secured Against the Presence of Wildlife:

The Understanding Interaction element scored lowest, indicating that there are significant gaps in understanding the underlying drivers and impacts of human-wildlife conflict. This suggests a need for more focused efforts to assess and comprehend the complex interactions between humans and wildlife, which is crucial for designing more effective interventions and adapting strategies over time.

3. Wildlife Thrives Alongside People:

The monitoring element scored lowest, which indicates a gap in the implementation of an effective monitoring system to track wildlife-related threats and assess the progress of HWC management efforts. This low score suggests that both service providers and community members perceive a lack of proper monitoring protocols to evaluate the effectiveness of interventions. Without robust monitoring, it becomes challenging to understand emerging risks or make informed decisions about interventions, resulting in increased vulnerability to both wildlife-related threats and impacts on human livelihoods. Addressing this gap is critical for adapting HWC management strategies to ensure both human and wildlife protection.

4. Habitat Sufficient to Ensure Sustainable Wildlife Populations:

The lowest score in this outcome was attributed to the monitoring element. It indicates that natural resources in the landscape are degrading, compromising habitat quality for wildlife to thrive, affecting wildlife populations and increasing the likelihood of conflict as wildlife encroaches on human settlements. And there is no comprehensive study on wildlife population dynamics, which limits the ability to make informed decisions for conservation and resource management. This lack of data hinders the ability to manage and sustain wildlife populations effectively.

4.3. Chiwog wise Results

The chiwog wise result of Outcome, Elements and Conflicting Species are presented as follows:

4.3.1. Singyegang-Tshogchuna Chiwog

In Singyegang-Tshogchuna Chiwog, HWC is primarily driven by Macaques, Birds, Snakes, Eagle, Barking deer and Monitor lizard. The community member revealed that this conflict species significantly contributes to negative interactions between humans and wildlife. These animals cause extensive damage to crops and properties, and casualties have also been reported within the chiwog.

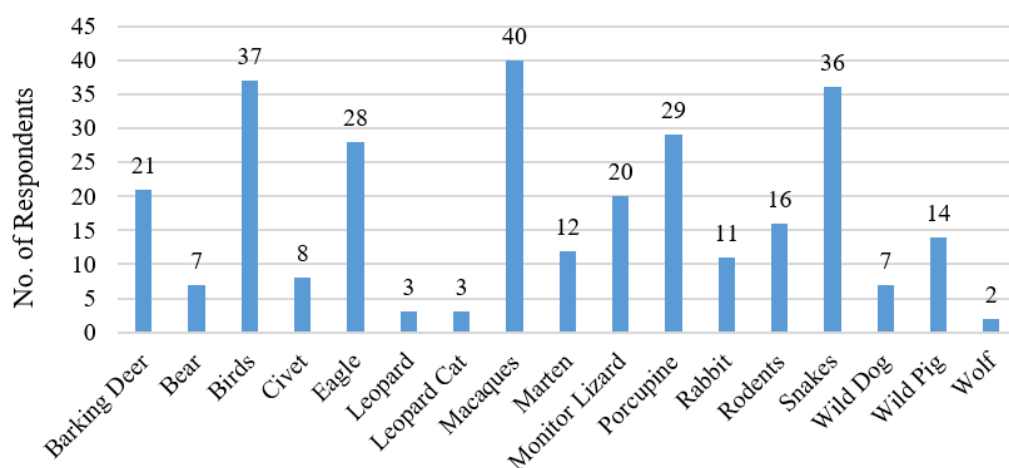


Figure 5: Conflict species of Singyegang-Tshogchuna Chiwog

Figure 6 highlights that **habitat** received the lowest score among all outcomes identified by both service providers and community members in the Singyegang-Tshogchuna chiwog. This highlights a critical need for focused efforts to restore and protect the habitats. Ensuring the sustainability of habitats is essential for maintaining biodiversity, mitigating wildlife threats to human settlements, and fostering long-term coexistence between people and wildlife.

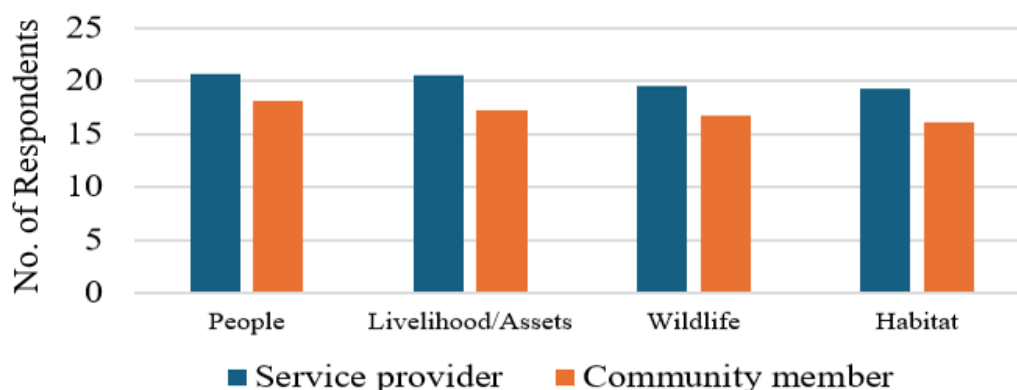


Figure 6: Result by Outcome of Singyegang-Tshogchuna Chiwog

In the Singyegang-Tshogchuna chiwog, Response received the lowest score under the people outcome, while prevention was the lowest-ranked element under the livelihoods/assets outcome. Similarly, mitigation scored the lowest under the wildlife outcome, and monitoring was identified as the weakest element under the habitat outcome, as shown in Figure 7.

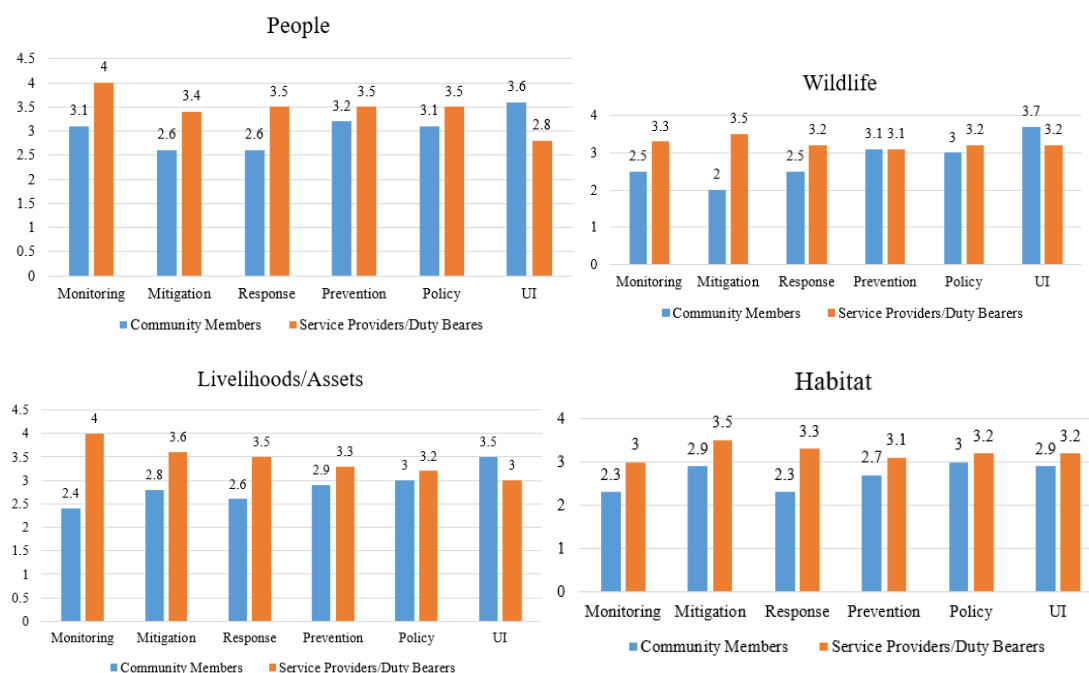


Figure 7: Result by Element of Singyegang-Tshogchuna Chiwog

4.3.2. Pedtshelnang Chiwog

According to Figure 8, Community Members identified Barking Deer, Bear, Birds, Civet, Eagle, Gaur, Langurs, Leopard, Leopard Cat, Macaques, Porcupine, and Snakes as the most conflicting species in the chiwog. These species have been associated with significant human-wildlife conflict, often impacting local livelihoods. The high frequency of encounters with these animals can lead to damage to crops, livestock predation, and threats to human safety. As a result, addressing these conflicts is crucial for promoting sustainable coexistence, ensuring both wildlife conservation and community well-being. Effective mitigation strategies must be implemented to reduce the negative impacts of these species on the community.

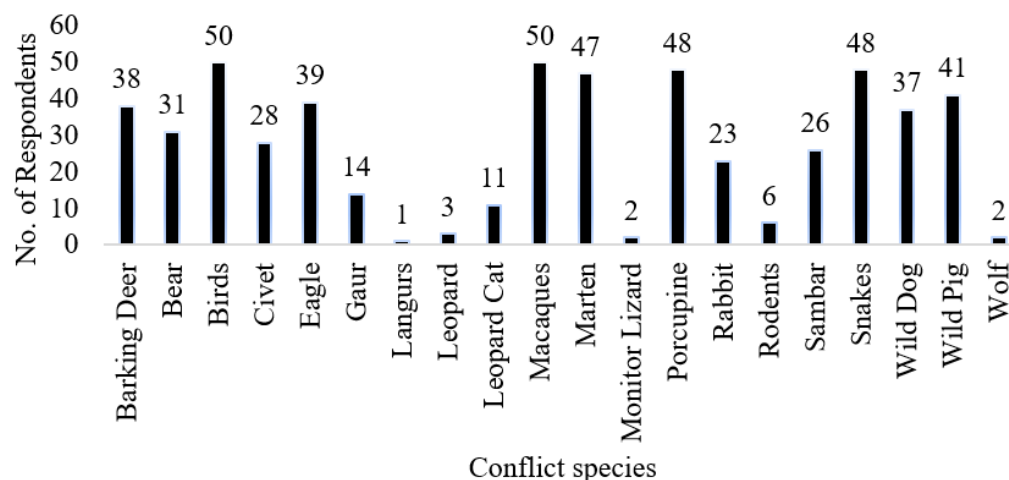


Figure 8: Conflict Species of Pedtshelnang Chiwog

Figure 10 shows that Livelihoods/Assets received the lowest score among all outcomes, as reported by both community members and service providers/duty bearers in the Pedtshelnang chiwog. To address this challenge, it is essential to implement interventions that mitigate the impacts on livelihoods while safeguarding the community's well-being. These efforts should focus on enhancing livelihoods in the chiwog and promoting coexistence between the community and wildlife.

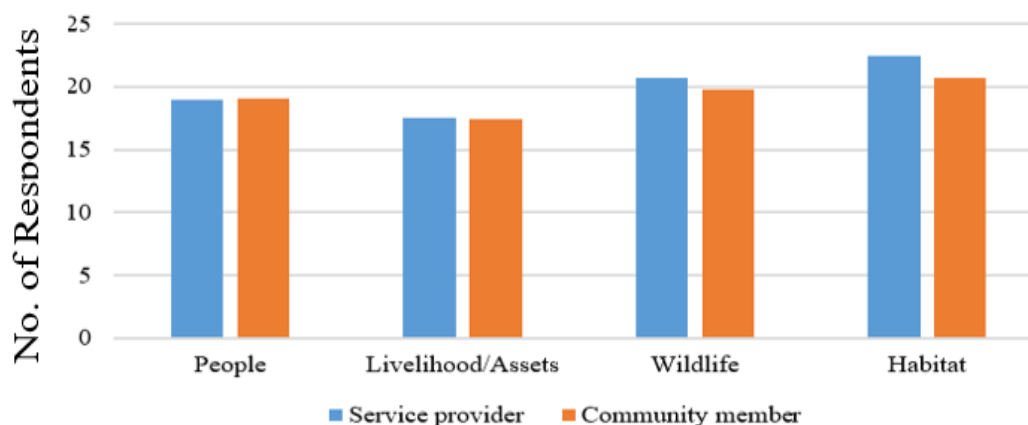


Figure 9: Results by Outcome of Pedtshelnang Chiwog

In the Pedtshelnang chiwog, the mitigation element received the lowest score under the people outcome, while understanding interaction was the lowest-ranked element under the livelihoods/assets outcome. Additionally, monitoring was identified as the weakest element under the wildlife outcome, and prevention was also highlighted as the key area which needs attention under the habitat outcome. These elements should be prioritized to address coexistence and reduce human-wildlife conflict in the chiwog.

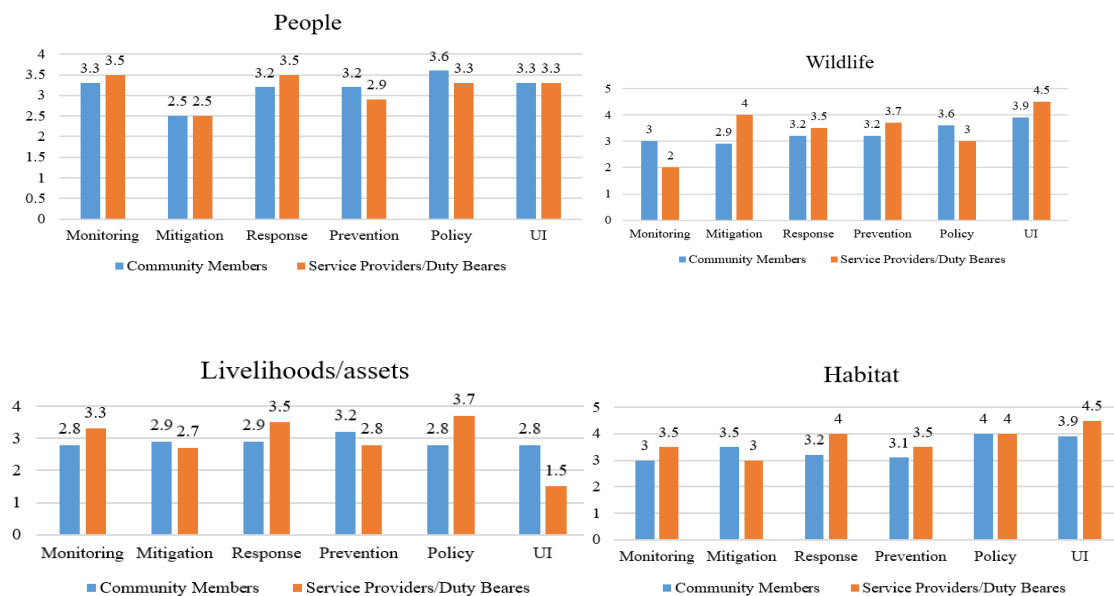


Figure 10: Results by Elements of Pedtshelnang Chiwog

4.3.3. Pekarling-Rinzingling Chiwog

In Pekarling-Rinzingling chiwog, both community members and service providers identified macaques, porcupines, snakes, birds, and wild dogs as the most conflicting species (Figure 11). Macaques and porcupines were mainly associated with crop damage, birds with losses to agricultural produce, wild dogs with livestock depredation, and snakes with safety concerns. The shared perception highlights the need for targeted, species-specific conflict mitigation measures.

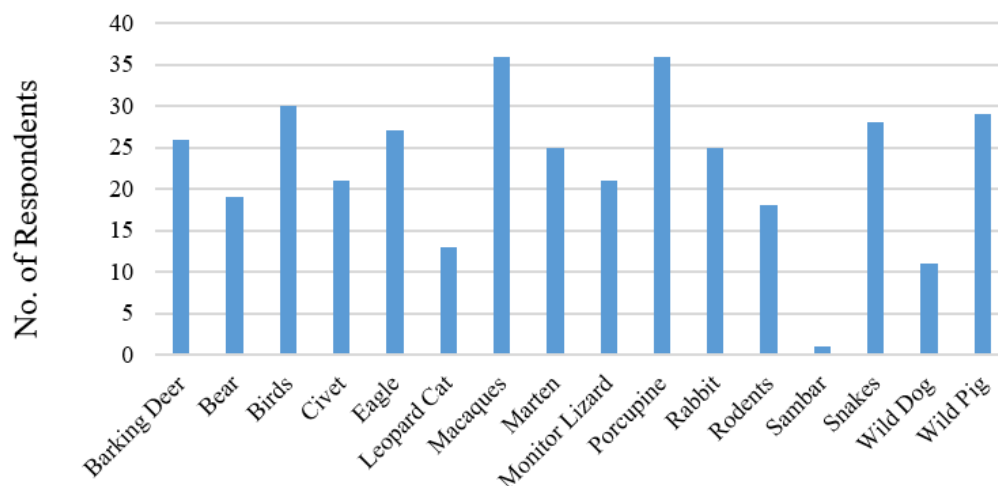


Figure 11: Conflict Species of Pekarling-Rinzingling chiwog

Based on the data in Figure 12, Wildlife received the lowest score among all outcomes in the Pekarling-Rinzingling chiwog. While service providers provided a uniform assessment across all indicators, community members rated

wildlife significantly lower than other categories. This discrepancy suggests that the community perceives a higher level of vulnerability or dissatisfaction regarding wildlife management, likely due to recurring human-wildlife conflicts that threaten local security and assets.

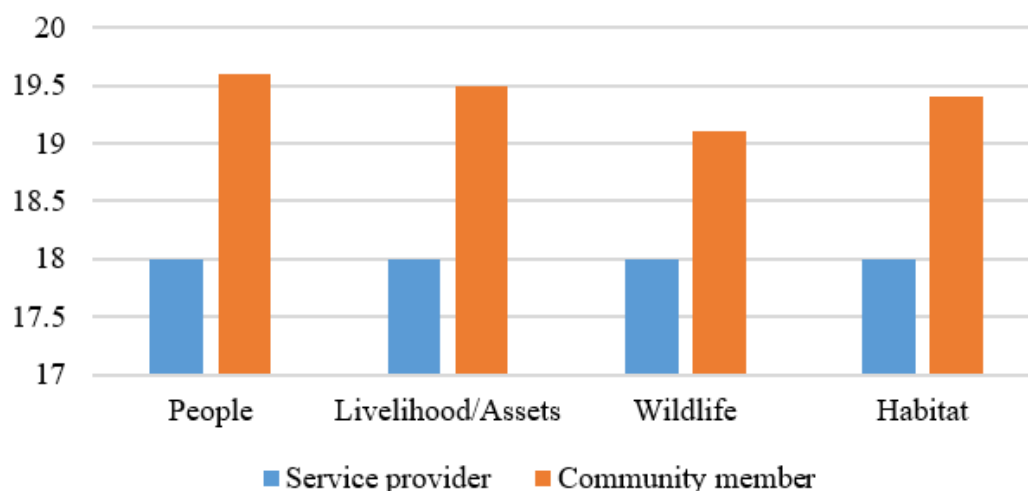


Figure 12: Result by Outcome for Pekarling-Rinzinling chiwog

In Pekarling-Rinzinling chiwog, the mitigation element has the lowest score for people and monitoring element under livelihoods/assets outcome, monitoring under habitat outcome and mitigation under wildlife and habitat outcome (Figure 13).

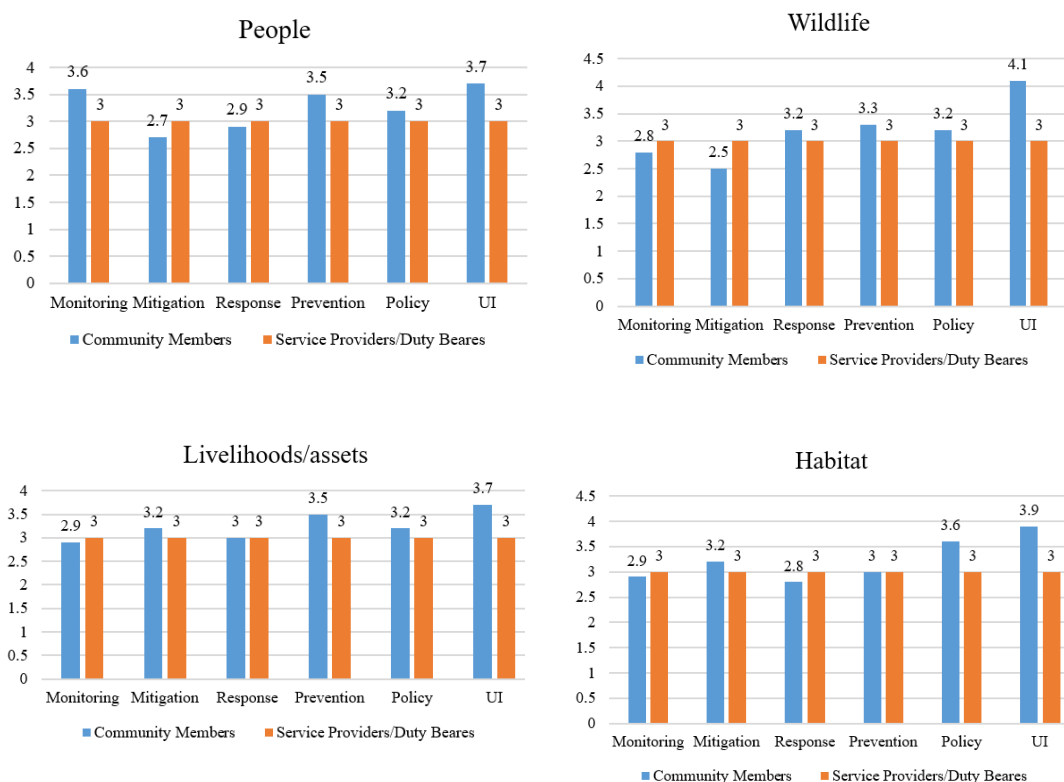


Figure 13: Results by Elements for Pekarling-Rinzinling chiwog

4.3.4. Khempaithang-Sonamthang Chiwog

In Khempaithang-Sonamthang chiwog, macaques, snakes, birds, and elephants emerged as the key species contributing to human-wildlife conflict (Figure 14). Crop losses were mainly attributed to macaques and birds, while elephant presence posed serious threats to both livelihoods and human safety. Snakes were identified largely due to safety concerns rather than economic damage.

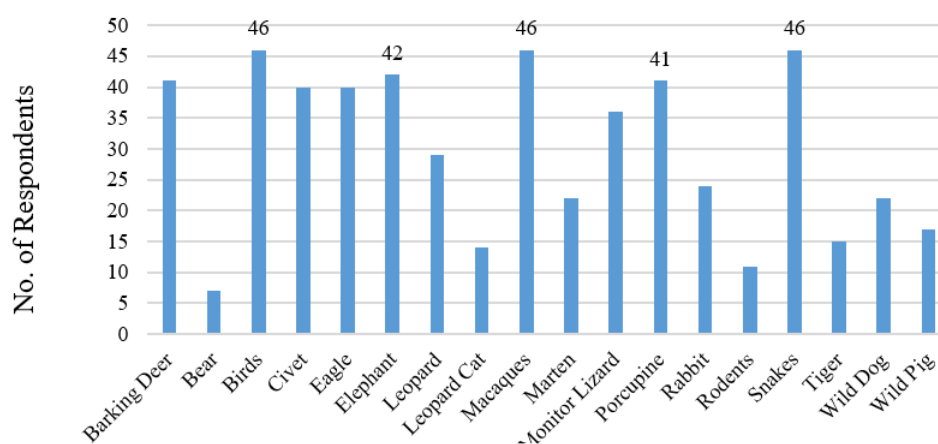


Figure 14: Conflict Species of Khempaithang-Sonamthang chiwog

As shown in Figure 15, the Livelihoods/Assets outcome received the lowest score among all outcomes, as reported by community members, since there were no service providers from this chiwog.

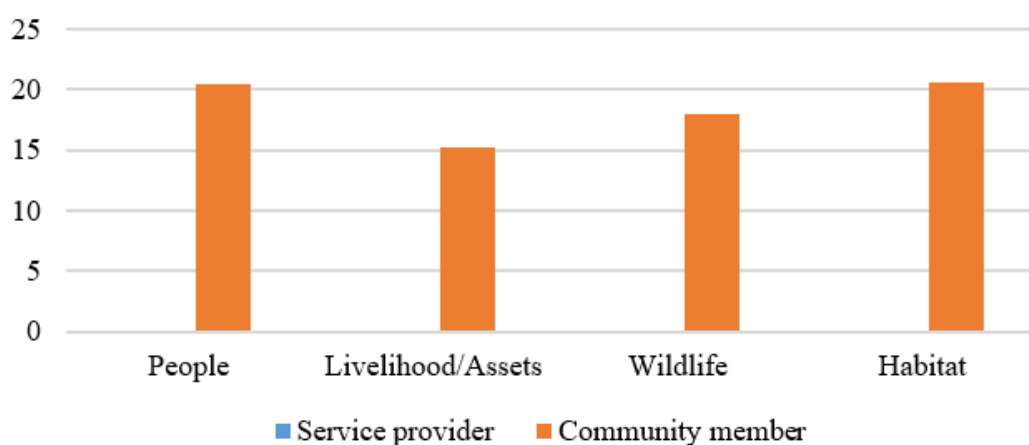


Figure 15: Results by Outcome of Khempaithang-Sonamthang chiwog

The mitigation element under the people outcome has the lowest score. Policy and UI element has the lowest score under livelihoods/assets and habitat outcome. The monitoring element has the lowest score under habitat outcome and **mitigation has the lowest score** under wildlife outcome for Khempaithang-Sonamthang chiwog (Figure 15).

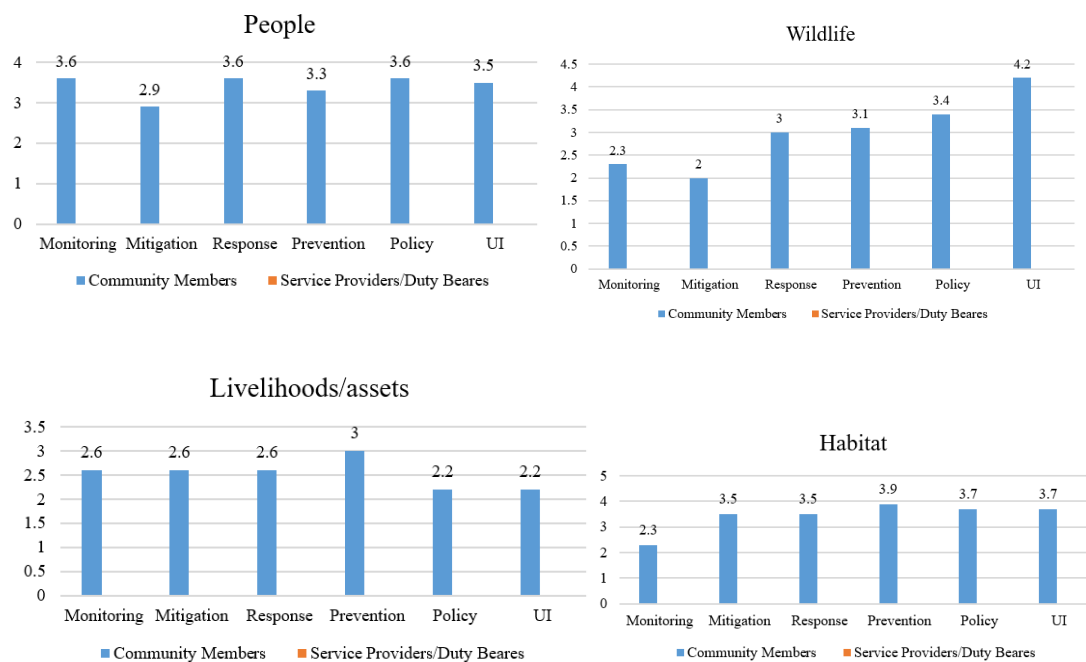


Figure 16: Results by Elements of Khempaitang–Sonamthang chiwog

4.3.5. Gongpogang-Pana Chiwog

In Gongpogang–Pana chiwog, Macaques and Snakes are the most prominent conflict species, cited by 48 respondents each. They are followed closely by Birds (45) and Porcupines (43), suggesting significant pressure on both crops and personal safety. While Barking Deer (36) and Marten (34) also pose notable challenges, larger animals like Elephants and Bears were reported less frequently. This diverse range of species indicates that the community faces complex, multifaceted threats to their agricultural productivity and livestock, as shown in Figure 17.

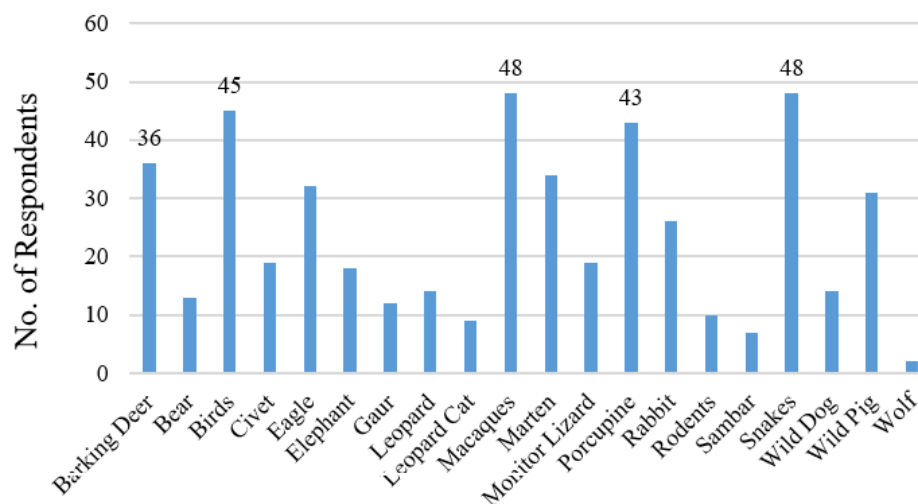


Figure 17: Conflict Species of Gongpogang–Pana chiwog

As shown in Figure 18, livelihoods/assets received the lowest score among all outcomes in the Gongpogang- Pana chiwog, as reported by community members and there were no service providers from this chiwog.

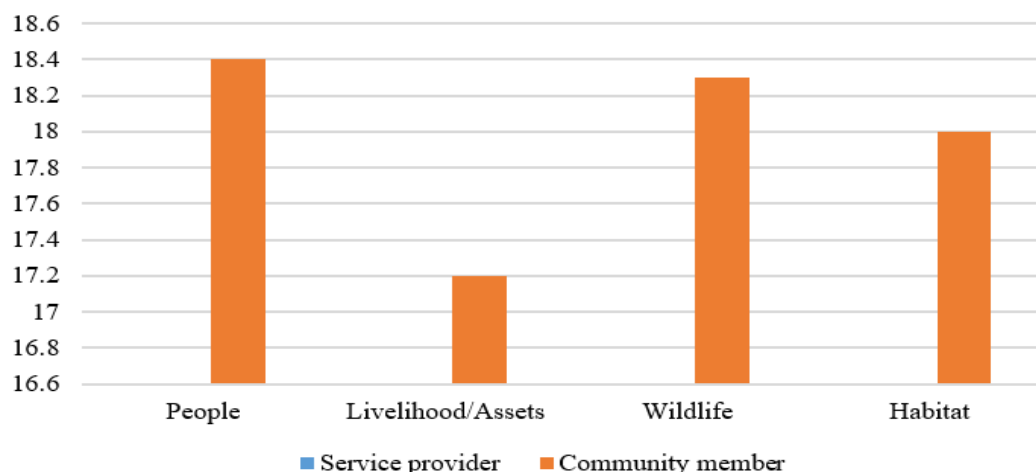


Figure 18: Results by Outcome of Gongpogang-Pana chiwog

The element mitigation has the lowest score for people and wildlife outcome and monitoring for livelihoods/assets and habitat outcome for Gongpogang-Pana chiwog (Figure 20).

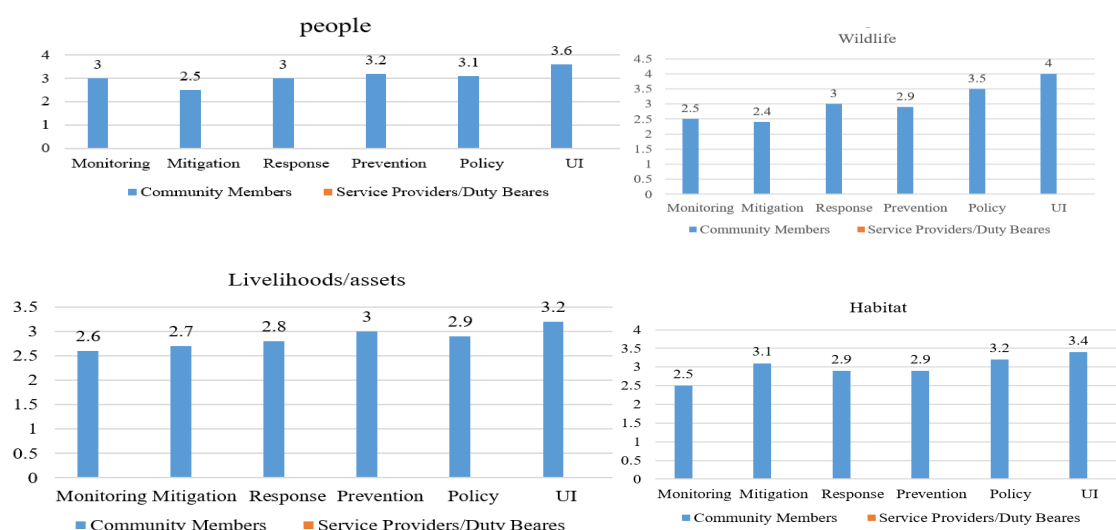


Figure 19: Results by Elements of Gongpogang-Pana chiwog

5. Conflict to Coexistence Strategy

The C2C Management Strategies for Sampheling gewog aim to transform Human-Wildlife Conflict into a model of coexistence by addressing root causes, enhancing community resilience, and promoting sustainable management practices. Building on insights from HWC-focused group

discussions, assessments, and chiwog consultations, the strategy focuses on mitigating conflicts with the most problematic species identified by community members and service providers, including barking deer, bears, macaques, birds, snakes, wild pigs, wild dogs, elephants, and monitor lizards.

Key interventions will prioritize safeguarding livelihoods and assets by strengthening crop protection measures and promoting alternative livelihoods. Community engagement remains central, with initiatives designed to empower local residents in managing wildlife interactions and fostering stewardship. Mitigation and prevention measures, such as physical barriers, early warning systems, and sustainable agricultural and livestock practices, will help minimize wildlife-related impacts on community livelihoods.

Policy integration will support the formulation and enforcement of wildlife conservation and conflict resolution frameworks, while regular monitoring will assess wildlife populations and the effectiveness of interventions. Habitat management will further reduce human-wildlife encounters. Collaborative efforts involving communities, service providers, government agencies, and NGOs will be essential for the strategy's long-term success.

This adaptive and integrated approach seeks to foster a harmonious balance between wildlife and communities, promoting sustainable coexistence. The strategy outlines 17 specific actions, detailed within the logical framework, with an estimated cost of Nu. 7.1 million for short-term actions and Nu. 23.6 million for long-term initiatives.

The total budget required for the 5-year C2C Strategy (2025–2029) for Sampheling Gewog is projected at Nu. 30.7 million (Table 5). To address this funding gap and ensure successful implementation, additional financial support must be secured from external donors or through supplementary contributions from the Royal Government of Bhutan (RGoB).

Table 4: Implementation Plan and Financial Outlays

Outcome	Activities	Location	Category	Responsibility (Lead/ Collaborator)	Budget (m)	Source	Timeline
People	1.1 Installation of electric fencing using concrete or HDPE poles	Pana A, B, C, Thongling, Sonamthang, Khempathang	Short-term	Tarayana / Gewog, DoFPS, DoA	2	WWF	2025-2026
	1.2 Provide safety gears for Forest Rangers	Sampheling	Short-term	DoFPS / Tarayana	0.8	WWF	2025-2026
	1.3 Awareness programs on policies, rules, wildlife conservation, HWC, and safety	Sampheling	Short-term	DoFPS / Gewog	0.5	WWF	2025-2026
Wildlife	2.1 Plantation of fruit trees	Pana (Gongpogang)	Short-term	DoFPS / Gewog	0.5	Potential donors	2025-2026

	2.2 Camera trapping to monitor and analyze human-elephant conflict interactions	Sampheling	Short-term	DoFPS / Gewog	0.2	WWF	2025-2026
Habitat	3.1 Create awareness on feeding of wild animals at village level	Sampheling	Short-term	DoFPS / Gewog	0.5	WWF	2026
	3.2 Monitor fruit tree harvesting and timber removal activities in forests	Gongpogang-Pana	Short-term	DoFPS / Gewog	0.5	Potential donors	2025-2026
	3.3 Restore and manage grazing lands to improve wildlife habitat	Gongpogang-Pana	Short-term	DoA & DoFPS / Gewog, DoL	0.3	Potential donors	2026-2027
	3.4 Habitat enrichment planting and establishment of water holes	Gongpogang-Pana	Long-term	DoFPS / Gewog	0.6	Potential donors	2026-2027
Livelihoods & Assets	4.1 Promote Agroforestry Practices: Integration of high-value fodder trees and fruit crops with traditional farming to reduce forest dependency, stabilize soil, and provide alternative income streams during HWC-related crop losses.	Allay	Long-term	DoA / Gewog, DoFPS	5	Potential donors	2025-2028
	4.2 Green net fencing around fields	Singyegang-Tshogchuna	Short-term	DoA / Gewog, DoFPS	0.5	Potential donors	2026-2027
	4.3 Installation of a robotic scarecrow for deterring squirrels	Singyegang-Tshogchuna	Short-term	Gewog / DoFPS, DoA	0.5	Potential donors	2026-2027
	4.4 Provide improved Jersey cattle breeds with shed construction support (cost-sharing)	Sonamthang-Sampheling	Long-term	DoL / Gewog, DoA, DoFPS	3	Potential donors	2025-2027
	4.5 Provide Jersey breeding bulls to support livestock improvement	Sonamthang-Khempathang	Short-term	Gewog / DoL, Gewog	0.3	Potential donors	2025-2026
	4.6 Install integrated chain-link fencing for enhanced area protection	Pana A, B, C, Thongling, Sonamthang, Khempathang	Long-term	Gewog / DoA, Dungkhag, DoFPS	10	Potential donors	2025-2027
	4.7 Pilot installation of light and bio-acoustic sound systems to deter animals	Singyegang-Tshogchuna	Short-term	Gewog & DoA / DoFPS	0.5	Potential donors	2025-2026
TOTAL					30.7		

6. Monitoring and Evaluation

Timely monitoring and evaluation of planned programs are essential for ensuring the effective achievement of intended outcomes. This section presents the approach for monitoring and evaluating the implementation of strategy actions. A comprehensive Monitoring and Evaluation (M&E) Plan, detailed in Table 5: Monitoring & Evaluation Framework, has been developed to align closely with the Implementation Framework. The plan incorporates specific indicators to assess the performance of the strategy, offering a clear foundation for tracking progress. Output indicators will focus on measuring the accomplishments of the identified actions, ensuring accountability and enabling continuous improvement throughout the implementation process.

6.1. Monitoring

Monitoring is a continuous assessment process designed to provide stakeholders with timely and detailed updates on the progress or delays of activities, ensuring transparency and clarity about their implementation status. For the 5-year strategy plan, the DFO Gedu will conduct annual monitoring to assess progress, address challenges, and ensure that the planned actions remain aligned with the intended outcomes.

6.2. Evaluation

The strategy will be evaluated twice during its implementation period to ensure effectiveness and alignment with its objectives. A midterm review will take place in the final quarter of the second year, followed by a final review in the last quarter of the fifth year. The evaluations will be conducted by a multidisciplinary team comprising internal members from DFO Gedu and external representatives from concerned functional Divisions. This collaborative approach ensures a thorough and impartial assessment of the plan's implementation and outcomes.

Table 5: Monitoring and Evaluation Framework

Outcome	Action	Action Indicator	Baseline	Unit	Year 1	Year 2	Year 3	Year 4	Year 5
People	1.1 Installation of electric fencing using concrete or HDPE poles	Length of Electric Fencing installed using concrete/HDPE poles	1	Length (m)	4000	5000			
	1.2 Provide safety gears for Forest Rangers	Number of safety gears provided	1	Number	1	1			
	1.3 Awareness programs on policies, rules, wildlife conservation, HWC, and safety	Number of awareness programs conducted	1	Number	1	1			

Wildlife	2.1 Plantation of fruit trees	Number of fruit trees planted	0	Number	200	200			
	2.2 Camera trapping to monitor and analyze human-elephant conflict interactions	Number of camera trap installed	1	Number	1	1			
Habitat	3.1 Create awareness on feeding of wild animals at village level	Number of awareness sessions on wild animal feeding conducted at the village level	1	Number		1			
	3.2 Monitor fruit tree harvesting and timber removal activities in forests	Number of regular inspections conducted to monitor fruit tree harvesting and timber removal activities in forests	1	Number	1	1	1	1	1
	3.3 Restore and manage grazing lands to improve wildlife habitat	Area of grazing lands restored and managed	0	Area (Ha)		1	1		
	3.4 Habitat enrichment planting and establishment of water holes	Area of habitat enrichment plantings and water holes established	1	Area (Ha)		1	1		
Livelihood/ Assets	4.1 Promote Agroforestry Practices: Integration of high-value fodder trees and fruit crops with traditional farming to reduce forest dependency, stabilize soil, and provide alternative income streams during HWC-related crop losses.	Number of agroforestry practices implemented	0	Number	1	1	1	1	
	4.2 Green net fencing around fields	Length of Green net fencing created	0	Length (m)		200	200		
	4.3 Installation of a robotic scarecrow for deterring squirrels	Number of robotic scarecrows installed for squirrel deterrence	0	Number		50	50		
	4.4 Provide improved Jersey cattle breeds with shed construction support (cost-sharing)	Number of improved Jersey cattle breeds provided and sheds constructed through cost-sharing support	0	Number	5	5	5		
	4.5 Provide Jersey breeding bulls to support livestock improvement	Number of Jersey breeding bulls provided for livestock improvement	0	Number	2	3			
	4.6 Install integrated chain-link fencing for enhanced area protection	Length of integrated chain-link fencing installed	0	Length (m)	500	500	1000		
	4.7 Pilot installation of light and bio-acoustic sound systems to deter animals	Number of light and bio-acoustic sound systems installed	0	Number	2	2			

7. Conclusion

The Conflict to Coexistence strategy for Sampheling gewog represents a holistic, community-centered framework to mitigate human-wildlife conflict and promote sustainable coexistence. Rooted in collaborative consultation, participatory assessments, and co-designed solutions, the strategy focuses on four critical outcomes—People, Livelihoods/Assets, Wildlife, and Habitat—guided by six interconnected elements: Policy, Prevention, Response, Understanding, Mitigation, and Monitoring.

By ensuring adequate habitats for wildlife, protecting community livelihoods, fostering coexistence through education and stewardship, and creating a thriving environment for both humans and wildlife, this strategy seeks to harmonize conservation with sustainable development. Its success will depend on active collaboration among local communities, government agencies, conservation partners, and stakeholders, supported by adaptive management and continuous monitoring.

With the committed involvement of the Sampheling community, this strategy has the potential to enhance ecological resilience, secure livelihoods, and establish the gewog as a leading example of human-wildlife coexistence. Through ongoing collaboration, innovation, and shared responsibility, Sampheling Gewog can achieve a sustainable balance where both people and wildlife thrive together.

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