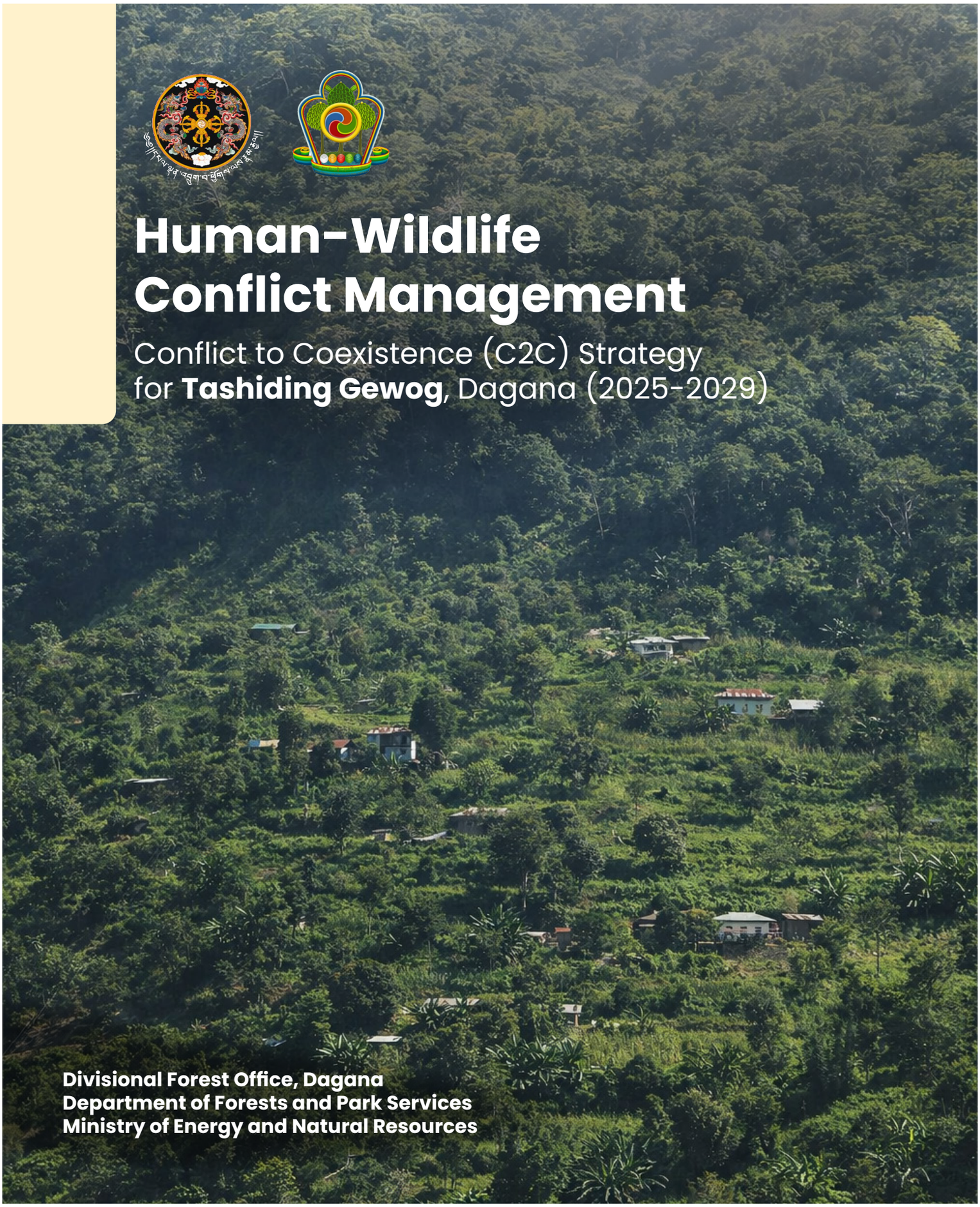

Human-Wildlife Conflict Management

Conflict to Coexistence (C2C) Strategy for **Tashiding Gewog**, Dagana (2025-2029)

Divisional Forest Office, Dagana
Department of Forests and Park Services
Ministry of Energy and Natural Resources

WWF

Supported by:

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

based on a decision of the German Bundestag

IKI INTERNATIONAL CLIMATE INITIATIVE

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Abbreviations

BPCL..... Bhutan Power Corporation Limited
C2C ..... Conflict to Co-existence
CBCM..... Community-Based Conflict Management
CFO..... Chief Forestry Officer
DFO..... Divisional Forest Office
DoFPS..... Department of Forests and Park Services
DoST..... Department of Surface Transport
FGDs..... Focused Group Discussions
HWC..... Human Wildlife Conflict
IKI ..... International Climate Initiative
LG..... Local Government
NC..... National Council
ORC ..... Outreach Clinics
PA ..... Protected Area
QRT ..... Quick Response Team
RNR-EC..... Renewable Natural Resources Extension Centre
RO..... Range Officer
SMART..... Spatial Monitoring and Reporting Tool
SRFL ..... State Reserve Forest Land
UI..... Understanding Interaction
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 Tashiding 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 Tashiding 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 Tashiding Gewog and the DFO Dagana 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 Tashiding Gewog is the result of a collective and dedicated effort by the staff of the Divisional Forest Office, Dagana. 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. Wangchuk Blon of DFO Dagana, 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 Tashiding Gewog in the years to come.

Contents

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1. Introduction

Human–Wildlife Conflict (HWC) has emerged as a significant global challenge in shared landscapes, where increasing competition between humans and wildlife over limited natural resources results in adverse impacts on livelihoods, conservation outcomes, and ecosystem integrity (FAO, 2023; Wangchuk et al., 2023). These conflicts commonly manifest as crop depredation, livestock predation, property damage, and threats to human safety, while retaliatory actions and habitat degradation further exacerbate risks to wildlife populations.

Bhutan, situated within the Eastern Himalayas biodiversity hotspot, maintains an extensive forest cover of 69.71%, reflecting the country's strong conservation commitment (FMID, 2023). While this forested landscape provides critical habitat for diverse wildlife species, it also increases spatial overlap between wildlife habitats and human settlements. Given Bhutan's predominantly agrarian society, with rural communities heavily dependent on subsistence farming, such overlap has intensified the frequency and severity of HWC, particularly in areas adjacent to forests.

Dagana Dzongkhag in southern Bhutan has been identified as one of the HWC-prone regions in the country. National hotspot assessments rank Dagana among the dzongkhag with higher crop and property damage, with substantial incidences of livestock depredation (Letro et al., 2021). Records from the Divisional Forest Office, Dagana indicate that gewogs such as Lhamoizingkha, Tashiding, and Lajab experience recurrent HWC. Between 2021 and 2023 alone, the dzongkhag recorded 1,389 HWC cases, of which crop damage constituted the majority, followed by livestock predation, property damage, and human casualties. These impacts pose serious threats to household food security, income stability, and community tolerance toward wildlife.

Tashiding Gewog under Dagana dzongkhag is particularly affected by HWC due to its proximity to forested areas and dependence on agriculture-based livelihoods. Recurrent crop damage and livestock loss impose considerable economic burdens on farming households, increasing vulnerability and undermining long-term livelihood sustainability.

Given the complexity and persistence of HWC in Dagana dzongkhag, including Tashiding Gewog, effective management requires a holistic and community-based approach. The Conflict to Coexistence (C2C) framework offers a structured methodology for planning, implementing, and monitoring HWC mitigation interventions. In line with this framework, the Community-Based Conflict Management (CBCM) model has been piloted in Dagana to promote community participation, preventive measures, and sustainable coexistence between humans and wildlife.

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

Tashiding gewog is one of the 13 gewogs under the administration of Divisional Forest Office, Dagana. The gewog center is located at Tashiding, approximately 45 kilometers from Dagana town. Covering an area of 39.52 square kilometers, Tashiding gewog has 412 households with a population of 3,520. It is divided into five sub-blocks, locally known as chiwogs (Dagana Dzongkhag, 2023).

The gewog is well-equipped with essential services, including two schools, one Outreach Clinics (ORC). It also hosts several important community structures, which includes a Lhakhang, a Renewable Natural Resources Extension Center (RNR-EC) and a forest office providing services to the people of five Chiwogs – Tashiding, Namchella, Norbuling, Shamdoley and Ganjab. The gewog is connected by the Tashiding-Dagana Road and is also accessible via other farms roads linking it to nearby gewogs and town centers (Dagana Dzongkhag, 2023).

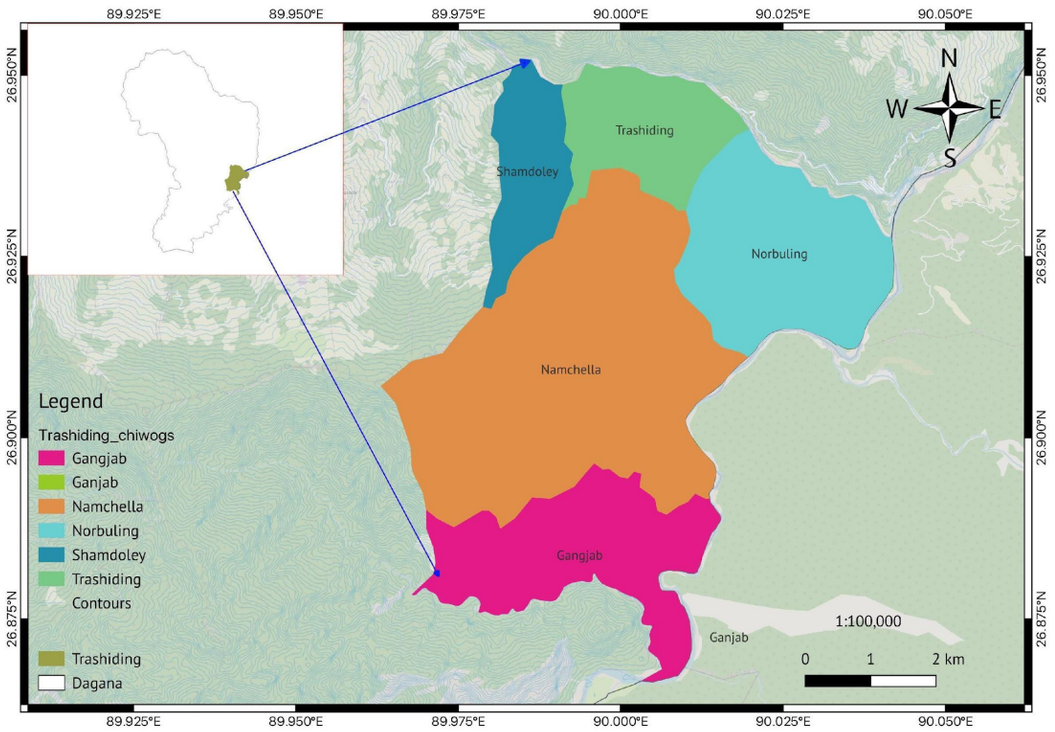

Figure 1. Location Map of Tashiding gewog

3.2. Methods

This strategy is developed based on the principles and methodologies of the C2C approach. The C2C framework provides a structured and integrated model for the systematic planning, implementation, and monitoring of HWC management. It is underpinned by key principles of holism, resilience, shared responsibility, and tolerance. The approach operates on four fundamental assumptions: achieving all four primary outcomes is essential for effective HWC management. By offering clear, stepwise guidance, the C2C framework supports the development of integrated and holistic strategies that balance long-term solutions with short-term interventions.

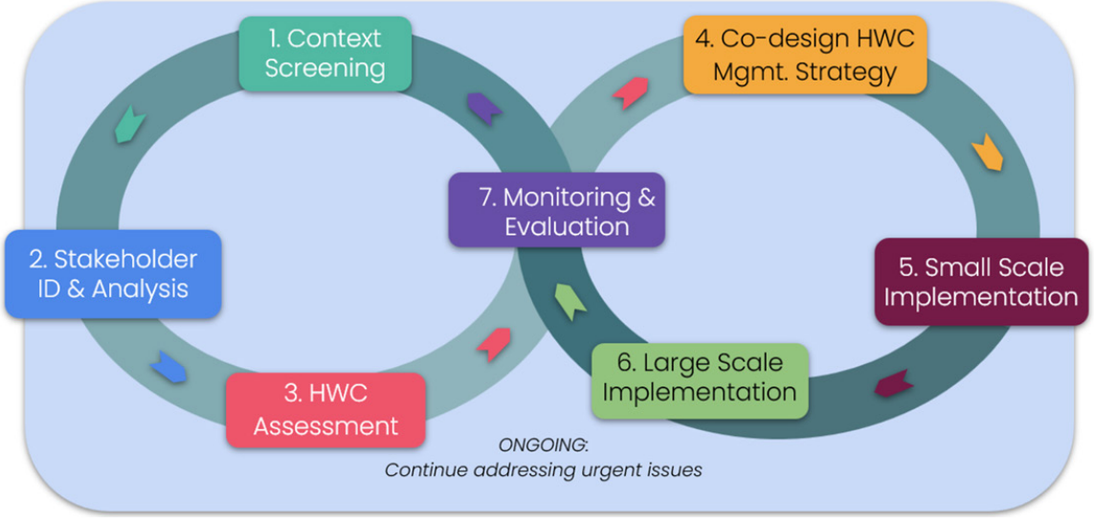

Figure 2. C2C: Conflict to co-existence framework

3.2.1. Context Screening

Context screening is a cornerstone for designing relevant interventions based upon knowledge of the local setting or situation in which HWC occurs. It ensures that everyone involved has a similar understanding of the situation and that the solutions created are appropriate for the people and the landscape. The context screening is the first step of the assessment process and involves identifying and understanding the details of a particular landscape and the current HWC situation. Before completing the context screening, all baseline information on the landscape were collected, and then the context screening form was completed by the C2C project manager.

Before completing the context screening, the C2C project manager collected all baseline information for the landscape such as social landscape mapping, government census documents, or any other resources. The C2C project manager also consulted colleagues, stakeholders (officials of LG) within the landscape to obtain the necessary information.

Sections of the context screening includes 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 HWC (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.

3.2.2. Stakeholder Identification and Analysis

Stakeholders are individuals or groups of individuals who have an interest, or "stake," in the subject under consideration, in this case the HWC situation. Typically, multiple stakeholder groups are involved in HWC scenarios. Some groups are directly impacted by HWC, others are involved in the management, while others are not directly affected but highly influential. For the C2C Approach, it is crucial to understand who stakeholders with regards to HWC are and how they can work together. Therefore, a core team was formed which consists of Chief Forestry Officer, IKI Project focal, Dagana, Range officer, Officials of LG, Geog agriculture and livestock extension officers and Tshogpas of five Chiwogs who carried out the stakeholder identification and analysis matrix.

Stakeholder analysis utilizing a stakeholder analysis matrix was carried out, wherein the stakeholders were grouped into clusters to inform the C2C assessment and consultations during the strategy development phase. This matrix applies a structured evaluation approach by addressing a series of questions rated on a scale of 1 to 5, focusing on the following dimensions:

- Stakeholders' level of interest in HWC and its management within Tashiding gewog.
- Their capacity to influence the long-term effectiveness of an HWC management plan.
- Their willingness and ability to engage in the collaborative design of the HWC management strategy.

Table 1. Stakeholder Analysis Matrix for Tashiding gewog

Stakeholder	Interest	Influence	Category
BPC	1	2	Low Interest, Low Influence
ORC	2	2	
Apiculture	2	2	
Businessman	3	2	Medium Interest, Low Influence
DOR	3	2	
Dairy Group	5	2	High Interest, Low Influence
Farmers	5	2	
Assistant Dzongkhag Agriculture Officer	5	3	High Interest, Medium Influence
Assistant Dzongkhag Livestock Officer	5	3	
Gewog Livestock Extension Officer	5	3	
Gewog Agri. Extension Officer	5	3	
DFO, Dagana (CFO)	5	3	
Tashiding Lam	1	4	Low Interest, Medium Influence
Threyma Lam	1	4	
Teachers	2	4	
Dasho Dzongdag	3	4	Medium Interest, Medium Influence
Community Forest Chairperson	4	4	
Media	4	4	
Tarayana	5	4	High Interest, Medium Influence
Tashiding Gup	5	5	High Interest, High Influence
Namchalla Tshogpa	5	5	
Trashiding Tshogpa	5	5	
Shamdolay Tshogpa	5	5	
Ganjab Tshogpa	5	5	
Norbuling Tshogpa	5	5	
Tashiding Mangmi	5	5	
District Administration	5	5	
RO (Dagapela)	5	5	
NC	5	5	
QRT Chairpersons	5	5	

The stakeholder analysis reveals a diverse range of interest and influence levels across groups involved in the HWC management strategy. Stakeholders with both high interest and high influence, such as local leaders (Gups, Tshogpas and Mangmi) and the Dzongkhag Administration, are key players who can significantly impact the strategy's success. Medium influence stakeholders, including extension officers, Community Forest Chairperson, and media organizations, also hold substantial interest in the initiative and can play supporting roles, particularly in information dissemination and resource management.

Low influence stakeholders, like farmers, dairy groups, and apiculture practitioners, have high interest but limited power to shape long-term outcomes. However, their active participation is essential for ground-level implementation. Conversely, stakeholders with low interest and influence, such as BPC and Outreach Clinic (ORC), have minimal direct impact on the initiative. This analysis highlights that fostering cooperation among high and medium influence stakeholders, while actively engaging community members with high interest, will be critical for the sustainable success of the HWC management strategy.

3.2.3. HWC Assessment

The "C2C" assessment in Tashiding was conducted over a period from 3rd – 20th June 20, 2024. Tashiding gewog comprises five chiwogs: Tashiding, Namchalla, Norbuling, Ganjab, and Shamdolay. To determine an appropriate sample size from the total household population,

Yamane's formula was applied: $n = \frac{N}{1+Ne^2}$, where n (203) represents the sample size, N (412) is the total population size, and e is the 5% margin of error. Based on this calculation, 203 households were selected and interviewed out of a total of 412 households across the five chiwogs in the gewog. For the sample representing service providers, 43 respondents were included, with at least two representatives from each institution or agency operating within Tashiding Gewog's jurisdiction. Efforts were made to alternate between male and female respondents to minimize gender bias within the sample.

Three different groups of interviewers were identified: Community Members, Service Providers/Duty Bearers, and C2C Project Manager. The Spatial Monitoring and Reporting Tool (SMART), which had predetermined questionnaires created especially for this purpose, was used to conduct in-person interviews to collect data.

3.2.4. Co-design

In Tashiding gewog, the co-designing process for human-wildlife conflict management strategy followed a participatory approach, ensuring that the strategies developed aligned closely with the needs and perspectives of the local communities. The process, which commenced from October 21 to November 5, 2024, involved systematic public consultations across each of the five chiwogs in the Gewog: Tashiding, Norbuling, Namchella, Shamdoley, and Gangjab.

A total of 235 community members participated in the consultation meetings, with 41.3% (n = 97) being female and 58.7% (n = 138) male (Table 2). Consultations were conducted in each chiwog to facilitate active

involvement of local stakeholders in the strategy development process. This participatory approach ensured the representation of diverse perspectives, enabling community members to articulate their concerns, priorities, and observations regarding HWC. The discussions provided critical grassroots-level information, capturing experiential knowledge and challenges faced by the communities.

Table 2. Participants from each Chiwog during the consultation meeting

Chiwog	Female	Male	Total participants
Norbuling	11	28	39
Tashiding	35	20	55
Namchalla	27	51	78
Shamdoley	22	21	43
Ganjab	2	18	20
Grand Total	97	138	235
%	41.28%	58.72%	100.00%

The results of the C2C assessment were shared during the consultation meetings which allowed for the 'data' to be integrated with the day-to-day lives of the community members. The participatory process not only affirmed the results of the assessment but also widened the vision of the participants on the extent and nature of the HWC issues that they have been living with. With the C2C assessment and input from the consultations, group members worked with the project manager to jointly develop appropriate mitigation measures. This participatory approach helped to make the strategies tailor-made, sensitive to culture, and collective responsibility of the people. Therefore, comprehensive approaches were developed that responded to the respective needs.

4. Results and Discussions

4.1. Demography and Social information

Understanding the demographic profile of community members was important to capture diverse perspectives within the community, providing a more inclusive representation. The sample consists of 58.72% male respondents (n = 138) and 41.28% female respondents (n = 97), reflecting a slightly higher representation of males compared to females. Within the age group, the

majority of respondents (42%, n = 98) were in the age group of 41–60, followed by 35% (n = 82) within 19-40, 22% (n = 52) over 60 and 1% (n = 3) in the age of 15-18 years.

Regarding the level of education, approximately 50.21% of the respondents (n = 118) were illiterate. This was followed by those who have education at the primary level (17.87%, n =42), secondary level (10.21%, n = 24), Non-Formal Education-NFE (11.91%, n = 28) and tertiary level (9.79%, n = 23). Such demographic data traces the social structure of the community in which people live, and this is important for designing specific and practical strategies aimed at the mitigation of HWC. Most of the community members practice agriculture, livestock rearing and are dependent on forest for their livelihood, which highlights the need for appropriate interventions for HWC management.

4.2. Overall Results for Tashiding Gewog

4.2.1. Conflict Species

Wild animals such as monkeys, barking deer, elephant, rodents, dhole and ungulates are listed as conflict species in Tashiding gewog. As per the assessment report, both the community and service provider/duty bearers have reported monkey as the most significant conflict animal in Tashiding gewog. The community members and service provider/duty bearer reported that the least significant conflict species were monitor lizards and langurs respectively. The graphical representation of the conflict animals is as shown in Figure 3.

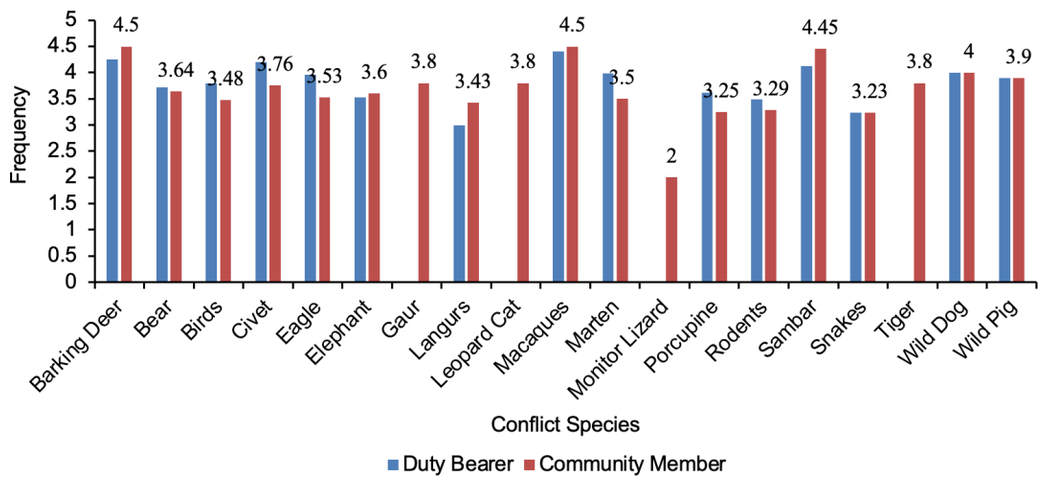

Figure 3. Graphical representation of conflicting species for Tashiding gewog

Conflict species recorded according to Service Providers/Duty Bearers reported a broader range including Elephants, Sambar, Wild dogs, Barking deer and Macaques.

Community Members also mentioned a wide variety of species including Deer and Wild Dogs.

4.2.2. Results by Outcome

The "Results by Outcome" section provides a detailed analysis of how different stakeholders perceive the impact of human-wildlife interactions in the Tashiding gewog. This section evaluates four key outcomes: People, Livelihoods/Assets, Wildlife, and Habitat. Each outcome is assessed based on responses from three groups: the C2C Project Manager, Service Providers/Duty Bearers, and Community Members. The scores for these outcomes reflect the stakeholders' perceptions and experiences regarding coexistence with wildlife.

Table 3. Scores related to four key outcomes assessed through stakeholder responses

Outcome	C2C Project Manager	Service Providers/Duty Bearers	Community Members
People	0.32	3.07	3.14
Livelihoods/Assets	0.08	2.13	2.47
Wildlife	0.67	3.48	3.28
Habitat	0.75	2.94	3.05

Note: *C2C Project Manager scores are between 0 and 1, while Service Providers and Community Members scores are between 1 and 5.*

All groups reported the lowest scores in "Livelihoods/Assets," indicating significant concerns about how wildlife impacts local economies and livelihoods. The consistently low scores in "Livelihoods/Assets" underscore the urgent need for interventions that address the economic impacts of wildlife on local communities while promoting co-existence strategies that benefit both people and wildlife populations. These findings suggest that while there is some recognition of the potential for coexistence, significant challenges remain, particularly concerning livelihoods affected by wildlife presence, which must be addressed through effective policy and community engagement

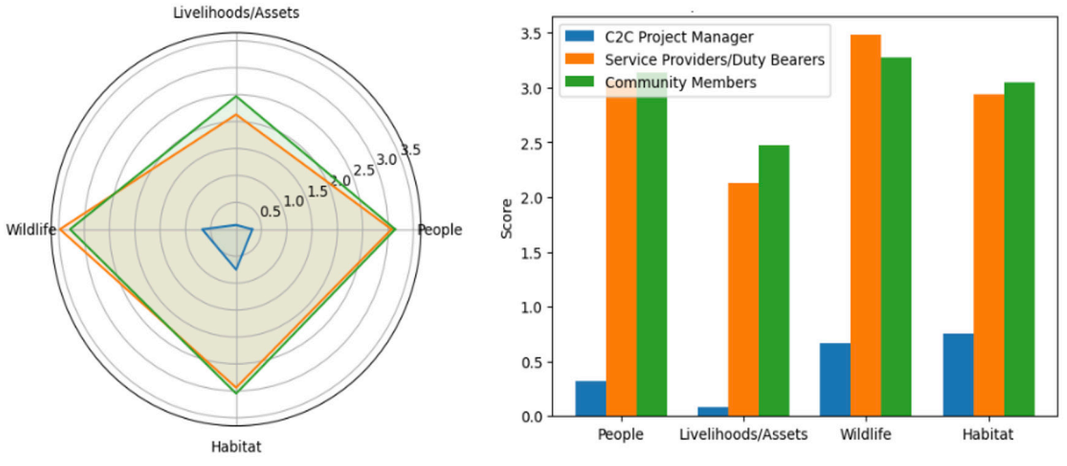

Figure 4. Results by outcomes for Whole Trashiding gewog

strategies. Choden and Tshering (2022) found similar findings and highlights successful case studies where local engagement has led to improved co-existence.

4.2.3. Results by Element

To achieve the four outcomes, six essential elements must be taken into consideration, each of which was assessed under the respective outcomes. The radar charts illustrate the perception of service providers/duty bearers and community members for different outcomes against six different elements of the co-existence framework.

I. People Able and Willing to Live Alongside Wildlife

The results indicate notable differences in perceptions and implementation across stakeholder groups. Community Members and Service Providers/ Duty Bearers consistently reported moderate to relatively high scores across most elements, particularly under Understanding Interaction, Policy, and Prevention, suggesting a reasonable level of awareness, institutional support, and preventive practices at the local and service-delivery levels.

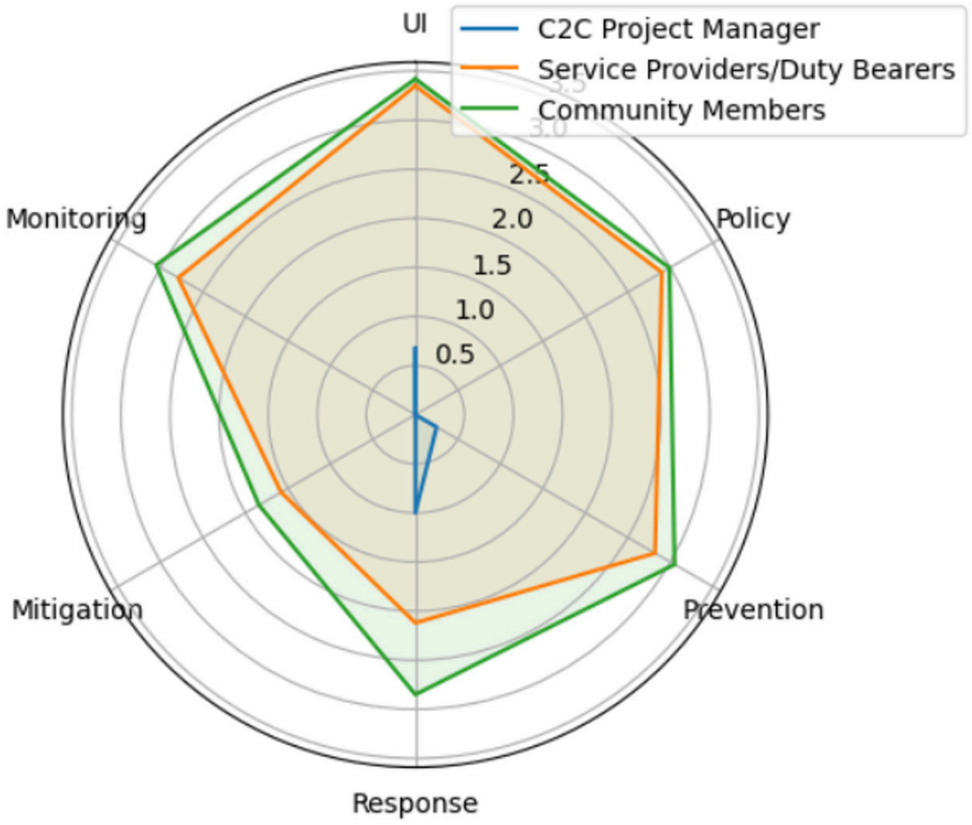

Figure 5. Graphical representation of result by element for People outcome

In contrast, C2C Project Manager's scores remain low across most elements, with values largely below 1. This reflects either limited direct engagement at the project management level or rigorous self-assessment criteria. The comparatively higher scores from Community Members in Understanding Interaction (3.42) and Prevention (3.05) suggest that awareness initiatives and preventive measures are more visible and effective at the grassroots level.

However, Response and Mitigation show relatively lower scores among Service Providers and Community Members, indicating potential gaps in timely response mechanisms and mitigation effectiveness during HWC incidents. Monitoring scores are moderate, suggesting that while some systems exist, they may not yet be fully systematic or participatory.

Overall, the findings suggest that while communities are increasingly willing and somewhat prepared to co-exist with wildlife, institutional response and mitigation mechanisms require strengthening to sustain positive attitudes and reduce conflict-related stress.

II. Livelihood/ Assets Secured Against the Presence of Wildlife

Figure 6 reveals a generally weaker performance compared to other elements. C2C Project Manager scores are uniformly low, indicating limited direct intervention or perceived effectiveness of livelihood-protection measures at the project design or coordination level.

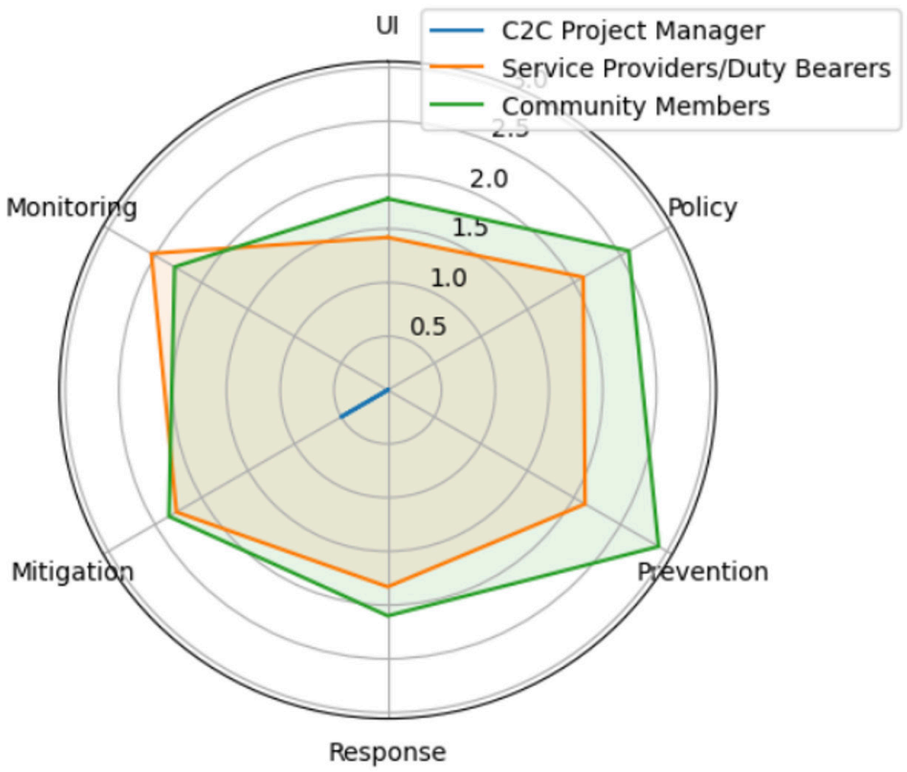

Figure 6. Graphical representation of result by element for Livelihood/Asset Outcome

Service Providers and Community Members report moderate scores, particularly under Policy, Prevention, and Mitigation, implying that some frameworks and practices exist to reduce wildlife-related losses. However, Understanding Interaction and Response score relatively lower, highlighting gaps in awareness dissemination and rapid support mechanisms following wildlife damage.

Community Members consistently score slightly higher than Service Providers, suggesting that communities may perceive incremental benefits from existing interventions, even if these are insufficient to fully safeguard livelihoods. The overall pattern indicates that livelihood security remains a critical vulnerability, with current measures not yet robust enough to offset wildlife-related risks.

These findings underscore the need for stronger livelihood-focused interventions, including compensation mechanisms, preventive infrastructure, and income diversification linked to co-existence strategies.

III. Wildlife Thrives Alongside People

Scores under this element are comparatively higher, especially among Service Providers and Community Members, suggesting a shared perception that wildlife conservation outcomes are relatively positive. High scores in UI and Policy reflect strong conservation awareness and supportive institutional frameworks.

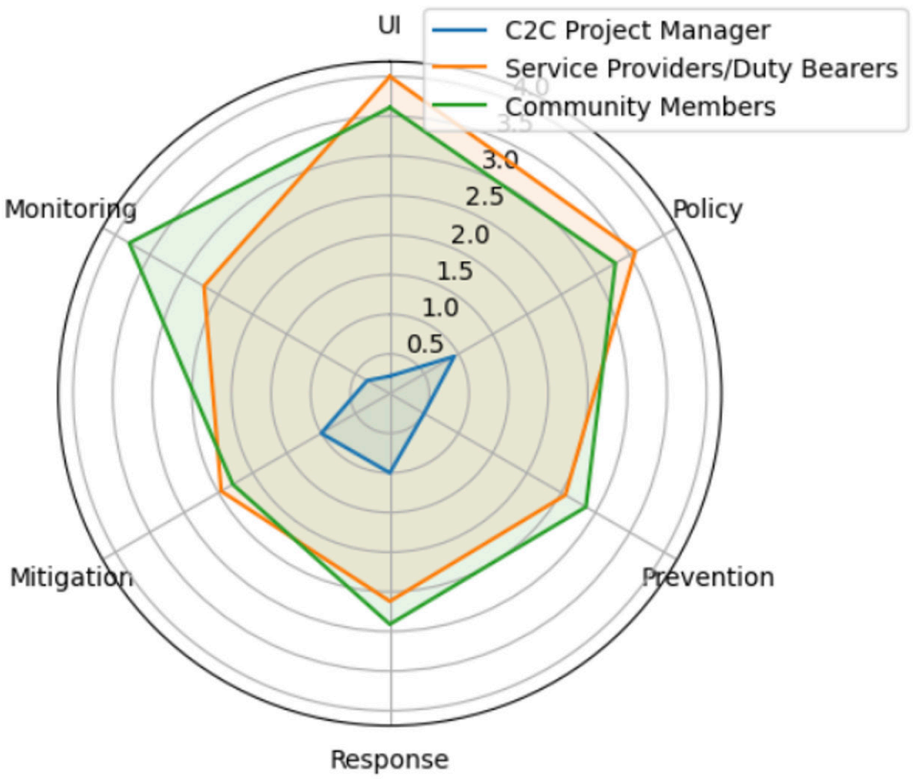

Figure 7. Graphical representation of result by element for Wildlife outcome

Community Members reported particularly high values in Monitoring (3.80), indicating active local observation of wildlife and perceived population presence (Figure 7). This suggests that communities are closely engaged with wildlife dynamics, even if formal monitoring systems may be limited.

C2C Project Manager's scores remain modest but slightly higher than in previous tables, particularly in Policy, Response, and Mitigation, implying better alignment of project-level objectives with wildlife conservation outcomes than with livelihood or coexistence challenges.

Despite positive conservation signals, moderate scores in Prevention and Mitigation highlight ongoing risks of conflict, suggesting that wildlife thriving may not always coincide with reduced impacts on people.

IV. Habitat Sufficient to Ensure Sustainable Wildlife Populations

This element shows the strongest overall performance across stakeholder groups. Service Providers and Community Members reported consistently high scores across most elements, particularly in UI, Response, and Policy, indicating confidence in habitat availability and management effectiveness.

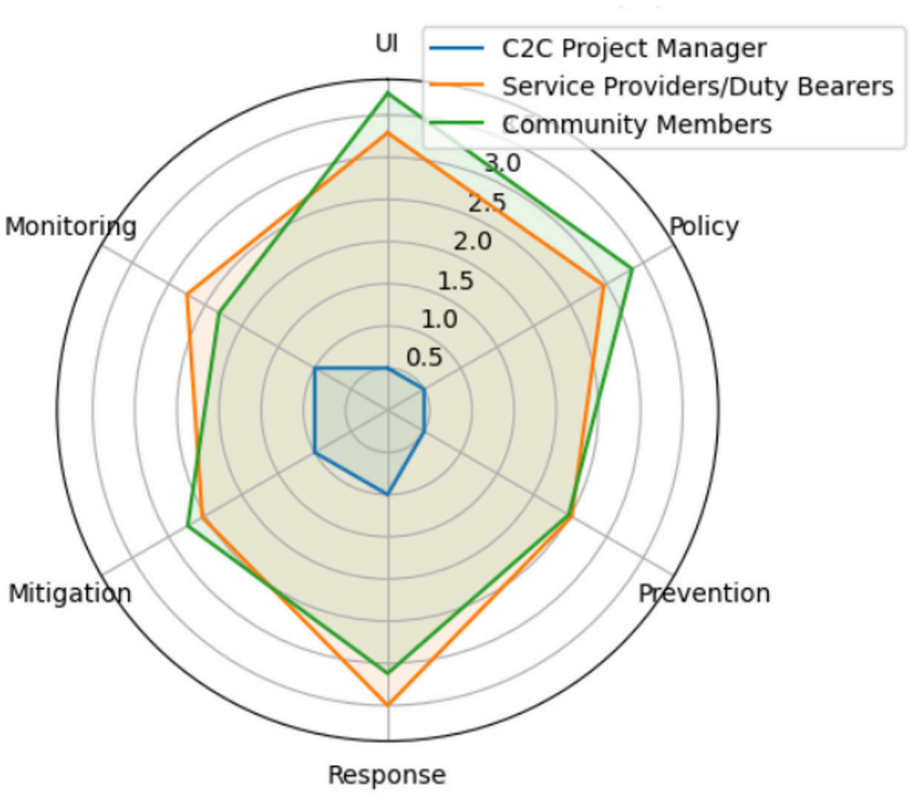

Figure 8. Graphical representation of result by element for the Habitat outcome

Community Members' high UI score (3.76) suggests strong local recognition of habitat adequacy, while Service Providers' high Response score (3.50) reflects institutional capacity to address habitat-related issues such as degradation or encroachment (Figure 8).

C2C Project Manager's scores are notably higher here than in other tables (mostly 0.5–1.0), suggesting greater project-level involvement and confidence in habitat-related interventions. This alignment indicates that habitat conservation is a relatively well-established and less contested domain within the C2C framework.

Nevertheless, moderate Monitoring scores among Service Providers and Community Members indicate opportunities to strengthen systematic habitat assessment and long-term ecological monitoring.

Across all six elements, the findings reveal a clear imbalance: habitat conservation and wildlife persistence score relatively high, while human dimensions, particularly response and mitigation remain comparatively weaker. Community Members consistently report higher scores than Service Providers, reflecting experiences and localized benefits, whereas C2C Project Manager's scores are uniformly conservative, suggesting either limited engagement or stringent evaluation standards.

These results highlight the need for future C2C approach to rebalance conservation success with human well-being, placing stronger emphasis on conflict response and mitigation systems to ensure long-term co-existence between people and wildlife.

4.3. Chiwog-wise results

4.3.1. Tashiding Chiwog

The chiwog wise results by outcome, element and conflict species are presented as follows.

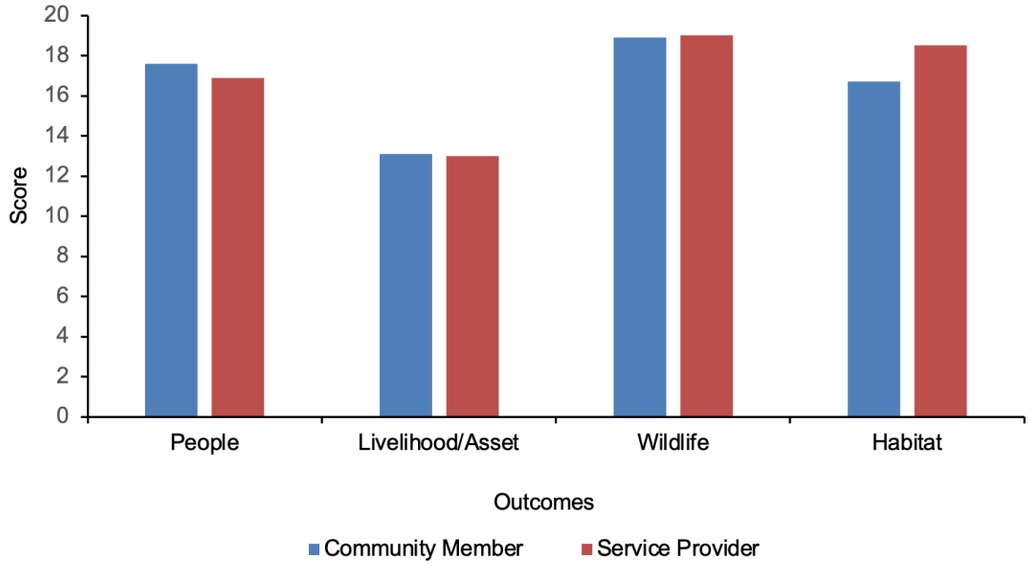

Figure 9. Graphical presentation of results by outcome for Tashiding chiwog

Figure 9 highlights perceptions of how HWC impacts four outcomes; people, livelihoods/assets, wildlife, and habitats in Tashiding chiwog. Respondents perceive livelihoods/assets and habitats as the most unsafe, with shorter bars indicating significant impacts such as crop damage, livestock loss, and habitat degradation.

People are moderately safe, reflecting some effectiveness in reducing direct threats to human life. Wildlife is perceived as relatively safer, suggesting conservation efforts may be protecting animals, but habitat threats remain critical. These results emphasize the need for targeted interventions to mitigate livelihood losses and restore degraded habitats while maintaining a balance between human and wildlife safety.

Similar findings in Bhutan regarding HWC emphasize significant impacts on livelihoods and habitats while highlighting varying safety levels for people and wildlife. For example, Wangchuk et al. (2023) and Letro et al. (2023) discuss the dual pressures of human-wildlife conflict on economic stability and habitat integrity, noting the need for community-driven mitigation efforts. Similarly, Wang and Macdonald (2009) explore economic losses and habitat degradation around Jigme Singye Wangchuck National Park (JSWNP), emphasizing community perceptions of safety.

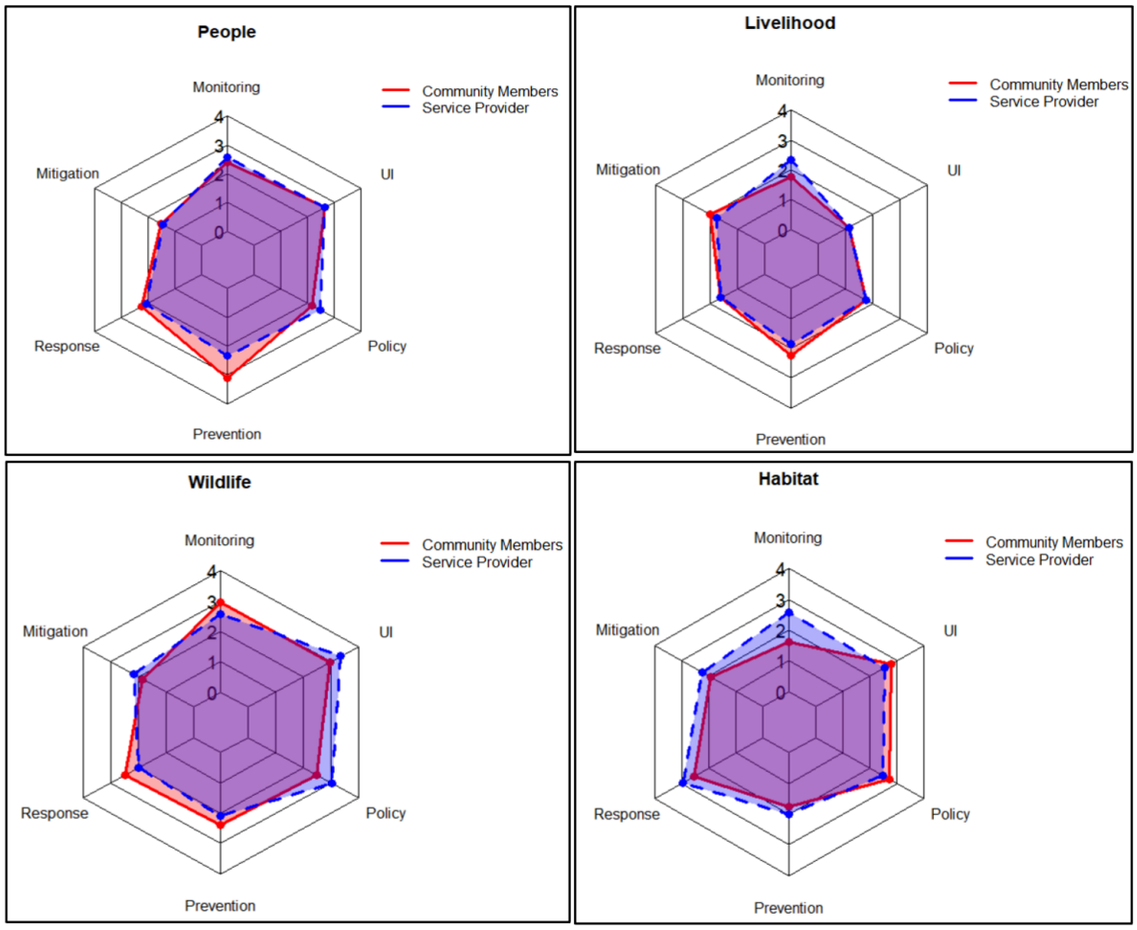

Figure 10. Graphical presentation of result by elements for Tashiding chiwog

The graph illustrates the role of six elements (policy, understanding interactions, mitigation, response, prevention, and monitoring) in impacting four outcomes—people, livelihoods/assets, wildlife, and habitats—in Tashiding chiwog due to human-wildlife conflict. Smaller scores indicate elements with the highest impact on each outcome.

- **People:** The lowest score corresponds to Mitigation, indicating that inadequate or ineffective mitigation measures have the greatest impact on people. This may reflect challenges in implementing strategies to protect human safety or reduce human-wildlife interactions effectively.
- **Livelihood/Assets:** For livelihoods, Understanding Interaction has the lowest score, showing that limited knowledge or awareness of wildlife behavior and interactions exacerbates the impact on economic activities, such as farming and livestock rearing.
- **Wildlife:** The element Mitigation again has the lowest score, suggesting that poor mitigation efforts, such as ineffective wildlife corridors or conflict prevention measures, significantly increase the risks faced by wildlife, such as retaliatory killings or injuries.
- **Habitat:** The lowest score corresponds to Prevention, highlighting that the lack of preventive measures, such as habitat conservation or protection efforts, leads to habitat degradation and increased vulnerability to human activities.

Mitigation emerges as a critical gap affecting both people and wildlife, while understanding interactions and prevention are significant factors for livelihoods and habitats, respectively. Addressing these weaknesses through targeted interventions can help reduce the overall impact of human-wildlife conflict in Tashiding chiwog.

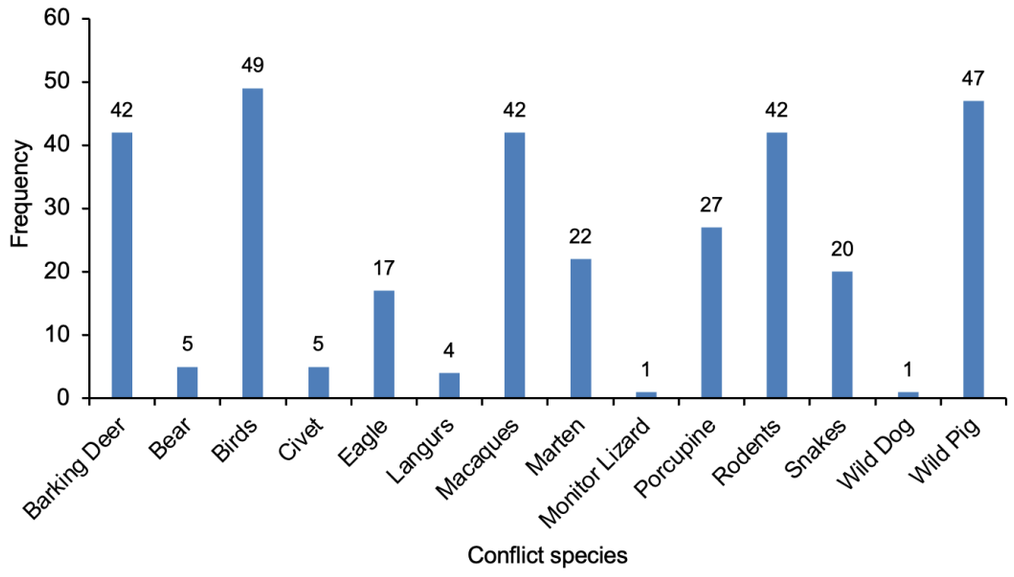

Figure 11. Primary Conflict Species of Tashiding chiwog

Figure 11 highlights the primary conflict species within Tashiding chiwog, with birds, wild pigs, and barking deer having the highest conflict frequencies (49, 47, and 42, respectively), mainly impacting crops and livelihoods. Barking deer also causes significant conflict (56), while macaques and porcupines moderately affect crops. Snakes, though less frequent (35), pose safety risks. Species like civets, langurs, and martens show lower conflict rates (6–25), and elephants and sambars have minimal impact (3 each). Leopards have no reported conflicts. The findings stress the need for targeted management of high-conflict species to reduce economic losses and enhance co-existence.

4.3.2. Ganjab Chiwog

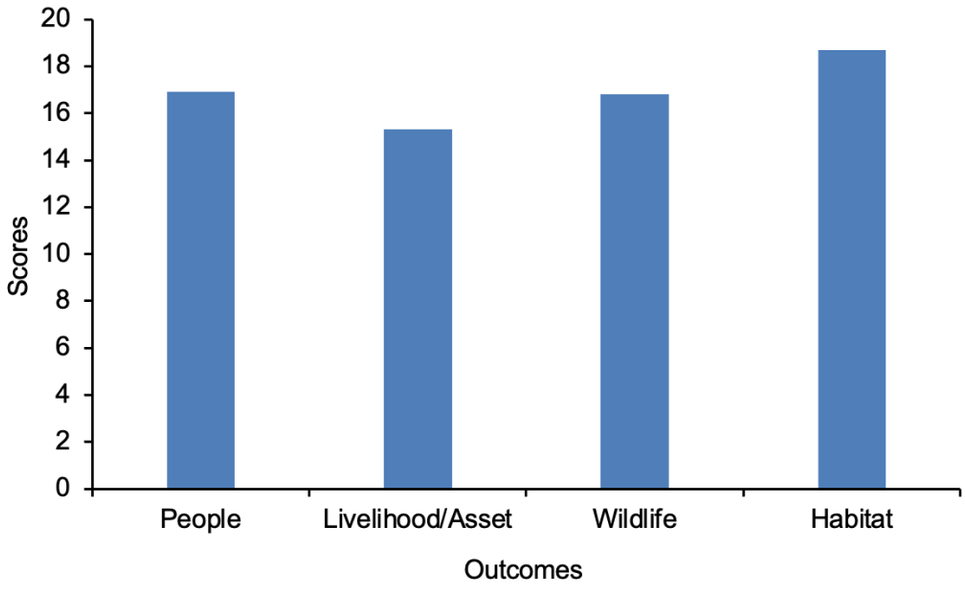

Figure 12. Graphical presentation of result by outcome for Ganjab chiwog

Figure 12 for Ganjab chiwog indicates that the highest impact of human-wildlife conflict is on livelihood/assets, as it has the shortest bar (15.3). This suggests significant economic losses, such as crop damage or livestock depredation. Wildlife (16.8) and people (16.9) are similarly impacted, reflecting threats to biodiversity and human safety, such as retaliatory actions or injury risks. Habitat (18.7), with the tallest bar, is comparatively less impacted, though it still faces pressures like degradation. These results highlight the urgent need for targeted interventions to address livelihood issues while safeguarding people and wildlife in Ganjab chiwog.

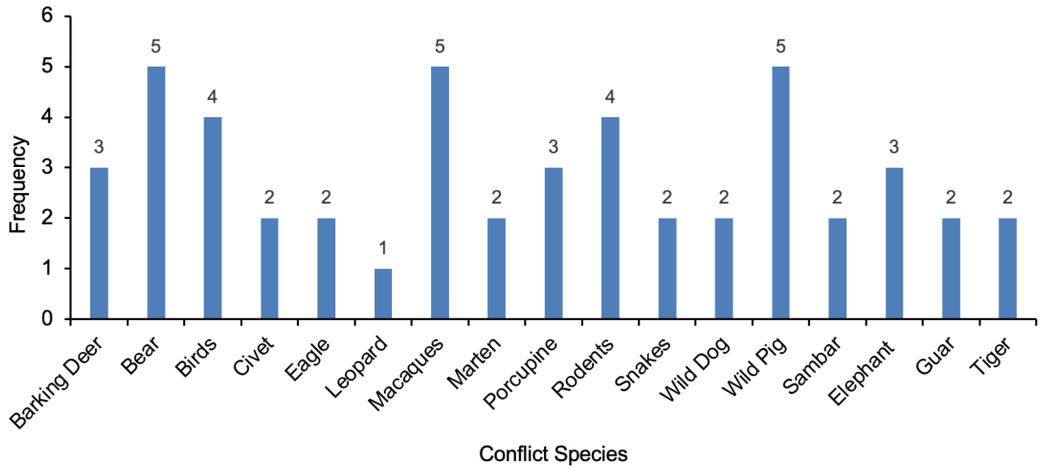

Figure 13. Primary Conflict Species of Ganjab chiwog

Figure 13 highlights the frequency of HWC in Ganjab, showing species like wild pigs, bears, and macaques as the most frequent contributors. These conflicts align with broader trends observed in Bhutan, where habitat loss from urbanization and agricultural expansion forces wildlife into human-dominated areas. Studies indicate that species like wild pigs and elephants cause significant crop damage, while bears and leopards pose risks to livestock and human safety (Wangchuk et al., 2023). Promoting sustainable land use and ensuring government support for conflict resolution remain critical to balancing biodiversity conservation with rural livelihoods (Dorji et al., 2024).

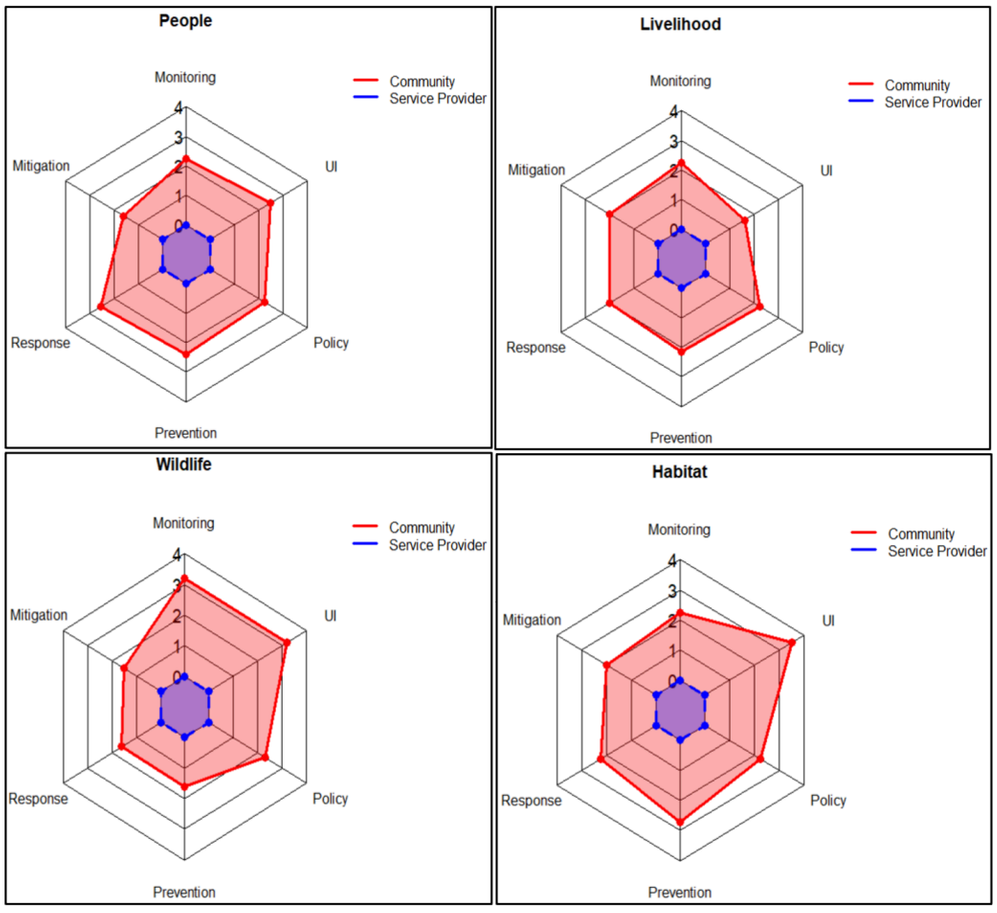

Figure 14. Results by Element for Ganjab chiwog

Monitoring and mitigation emerged as the most impactful activities across all elements (Figure 14), highlighting the critical need for robust systems to track wildlife and implement effective conflict-reduction measures, such as barriers or scare devices. In contrast, policy and understanding interaction (UI) show consistently lower impacts, indicating gaps in governance and limited active community engagement in developing long-term solutions. Prioritizing high-impact areas like monitoring and mitigation can address immediate HWC challenges, while simultaneously strengthening policy frameworks and enhancing community participation to ensure sustainable, community-driven solutions in the future.

4.3.3. Namchalla Chiwog

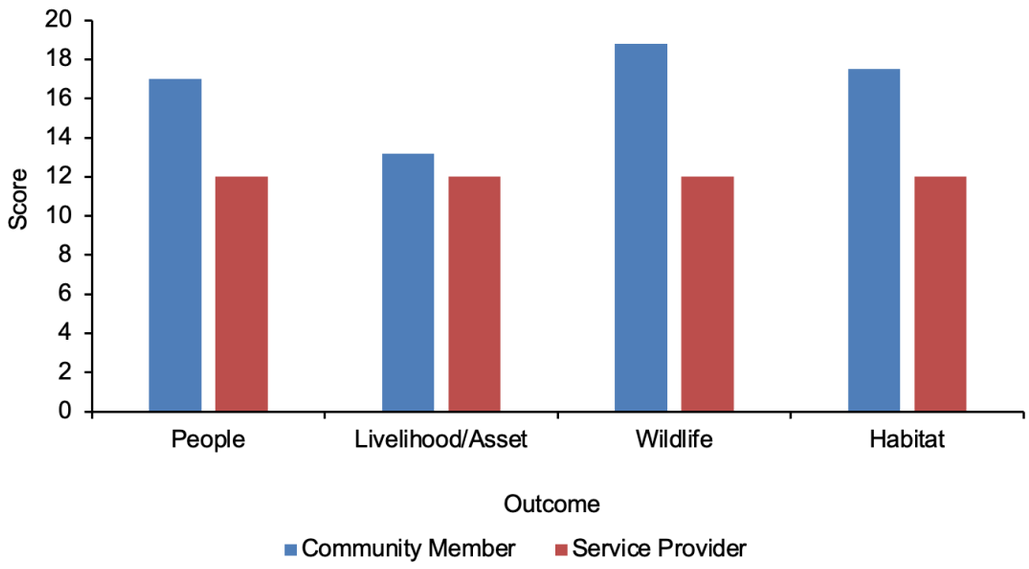

Figure 15. Graphical presentation of result by outcomes for Namchalla chiwog

Community members reported higher concerns about people, livelihoods/assets, wildlife, and habitat, suggesting they are most affected by direct conflicts like crop damage and livestock predation (Figure 15). Service providers, with similarly lower scores, seem less directly impacted, focusing more on broader conservation efforts. This highlights the need for C2C strategies that address local challenges while integrating expertise from service providers for sustainable solutions. Moreover, both service providers and community members of Namchalla chiwog reported that the livelihood and assets are being affected the most due to HWC.

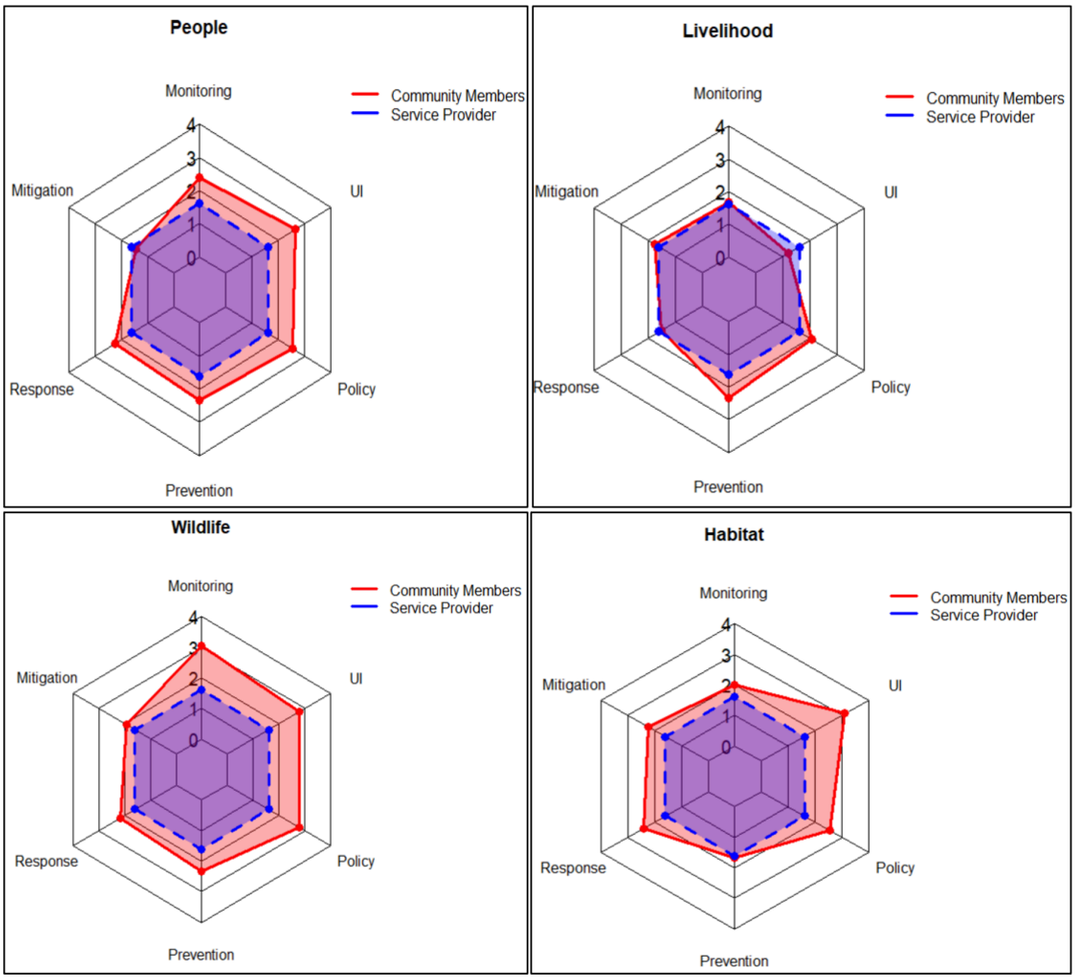

Figure 16. Graphical representation of result by elements for Namchalla chiwog

Figure 16 illustrates the role of six elements (policy, understanding interactions, mitigation, response, prevention, and monitoring) in impacting four outcomes (people, livelihoods/assets, wildlife, and habitats) in Namchalla chiwog due to HWC. Lowest scored elements show the highest impact on each outcome.

- **People:** The lowest score corresponds to Mitigation, indicating that inadequate or ineffective mitigation measures have the greatest impact on people. This may reflect challenges in implementing strategies to protect human safety or reduce human-wildlife interactions effectively.
- **Livelihood/Assets:** For livelihoods, Understanding Interaction has the lowest score, showing that limited knowledge or awareness of wildlife behavior and interactions exacerbates the impact on economic activities, such as farming and livestock rearing.
- **Wildlife:** The element Mitigation again has the lowest score, suggesting that poor mitigation efforts, such as ineffective wildlife

corridors or conflict prevention measures, significantly increase the risks faced by wildlife, such as retaliatory killings or injuries.

- **Habitat:** The lowest score corresponds to Prevention, highlighting that the lack of preventive measures, such as habitat conservation or protection efforts, leads to habitat degradation and increased vulnerability to human activities.

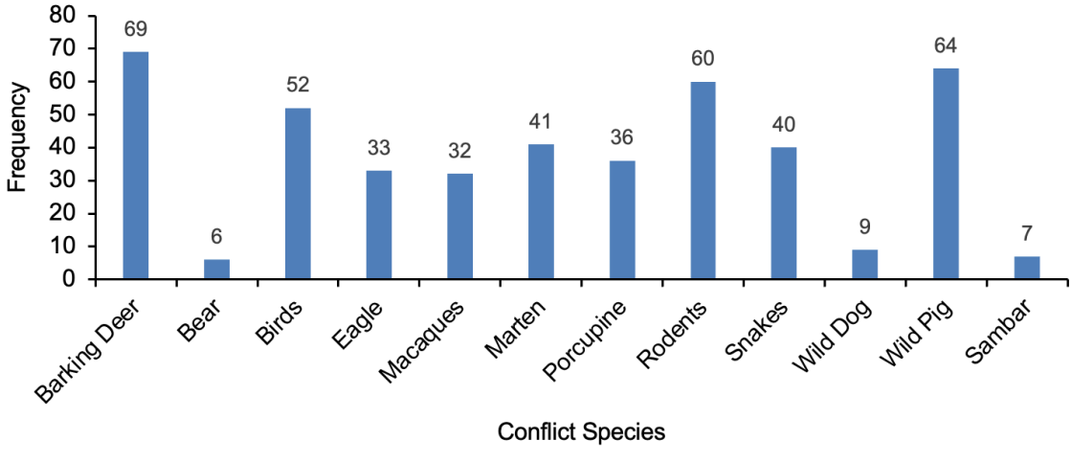

Figure 17. Primary Conflict Species in Namchalla chiwog

Figure 17 highlights the primary conflict species within Namchalla chiwog, with barking deer, wild pigs, and rodents having the highest conflict frequencies, mainly impacting crops and livelihoods. Barking deer also causes significant conflict (69), while macaques, porcupines, snakes and birds moderately affect crops. Species like bears, wild dogs and sambars show lower conflict rates (6–10. The findings indicate the need for targeted management of high-conflict species to reduce economic losses and enhance coexistence.

4.3.4. Norbuling Chiwog

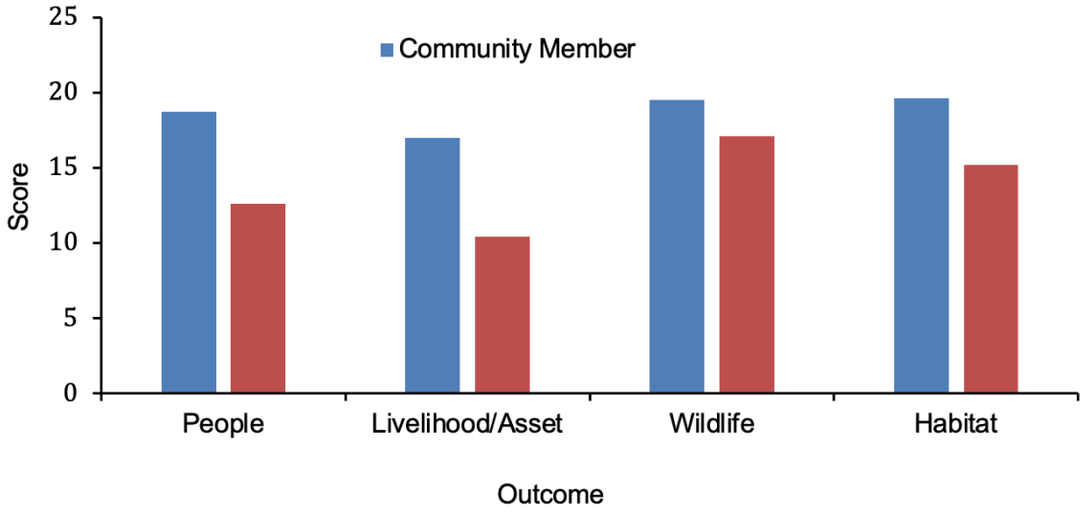

Figure 18. Result by outcomes for Norbuling chiwog

The graph (Figure 18) shows that "Livelihood/Asset" is the most affected outcome of HWC for both community members and service providers, indicating severe economic impacts. Community members, who rely heavily on farming and livestock for their livelihoods, face significant losses due to crop damage, livestock predation, and property destruction caused by wildlife, directly threatening their income and food security. Service providers also recognize the critical nature of these economic losses, reflecting the widespread and immediate consequences of HWC on rural livelihoods. This highlights the urgent need for targeted interventions, such as mitigation strategies and sustainable land-use practices, to address livelihood vulnerabilities and reduce conflict.

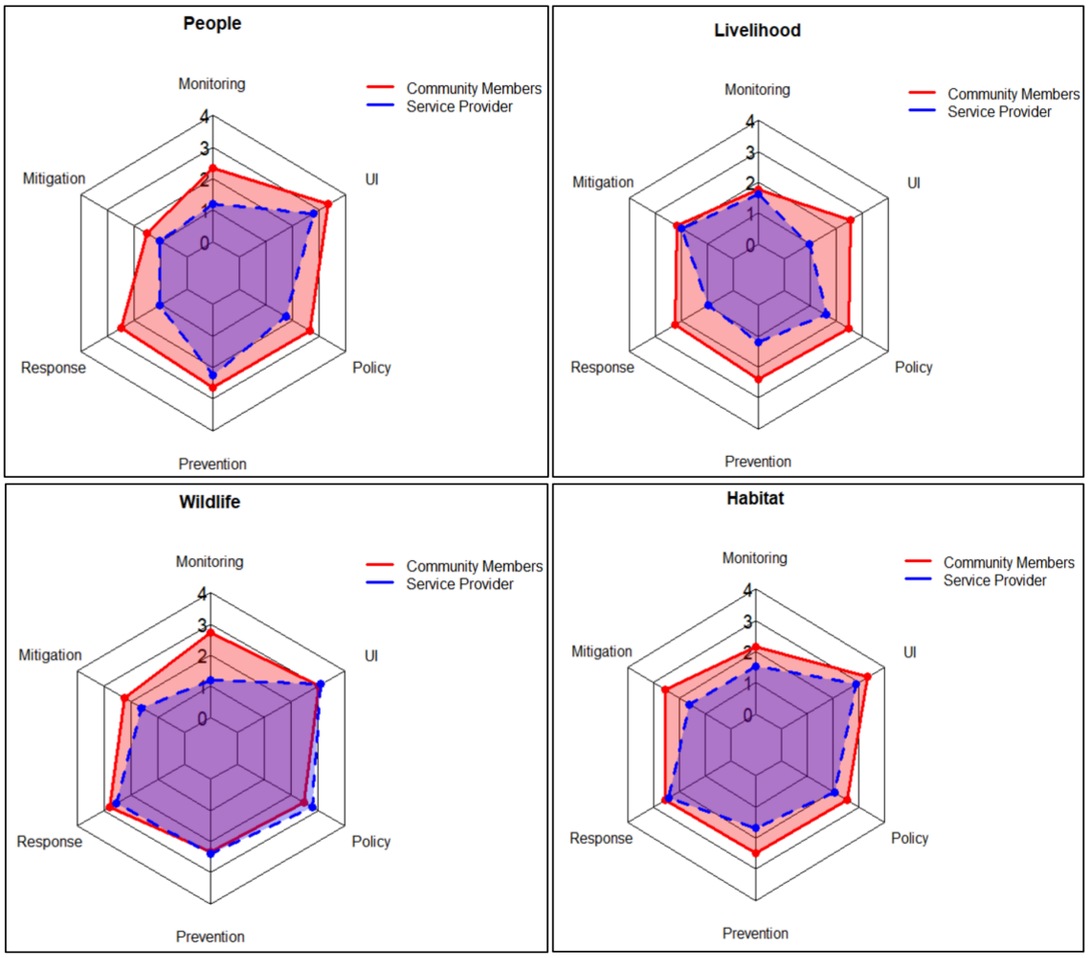

Figure 19. Graphical representation of result by elements for Norbuling chiwog

Across all elements, mitigation and monitoring emerge as the weakest areas (Figure 19), indicating a need for enhanced field-level data collection, quicker intervention mechanisms, and resource allocation. Policy and prevention measures show potential but require better implementation to address community and wildlife needs effectively. A collaborative approach, incorporating community inputs and service provider expertise, is essential to improve HWC management comprehensively.

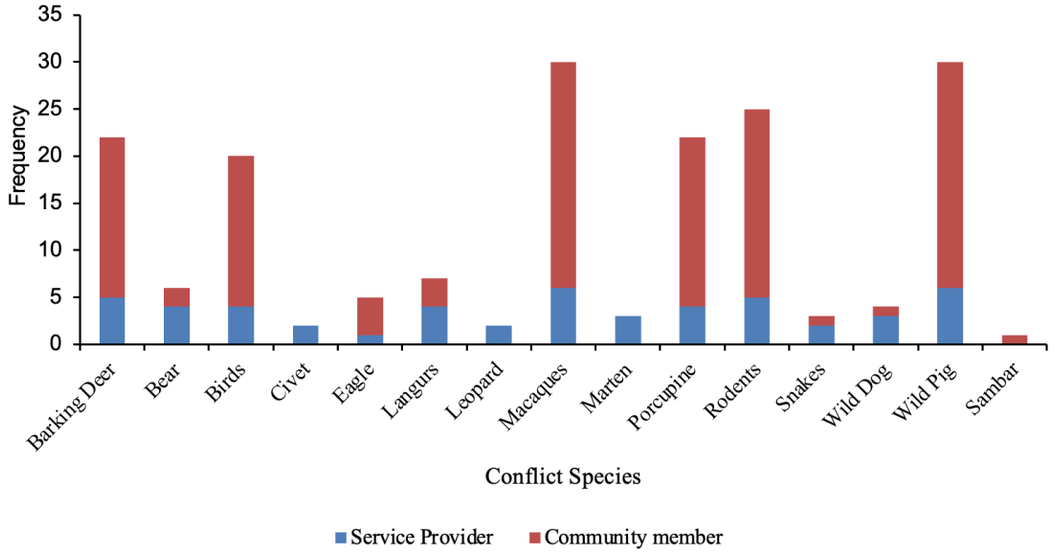

Figure 20. Primary Conflict Species of Norbuling chiwog

As shown in Figure 20, human–wildlife conflict in Norbuling chiwog is predominantly associated with crop-raiding species, with macaques and wild pigs recording the highest conflict frequencies among both service providers and community members. Rodents and porcupines also contribute substantially to conflict incidents, indicating that small to medium-sized, adaptable species are the primary drivers of recurring livelihood losses. In contrast, large mammals such as barking deer and sambar exhibit moderate conflict levels, while large carnivores are reported less frequently.

Figure 20 further reveals a consistent discrepancy between respondent groups, with community members reporting higher conflict frequencies than service providers across most species. This difference likely reflects variations in lived experience, perception of loss, and reporting systems, as community members directly face crop damage and associated impacts, whereas service provider records may be limited to officially reported or verified cases.

Overall, the patterns illustrated in Figure 20 suggest that HWC in Norbuling chiwog is largely crop-related rather than driven by predation or direct safety threats. Accordingly, management efforts should focus on crop protection and community-based mitigation measures targeting the most frequently reported species, while maintaining appropriate monitoring and response mechanisms for less frequent but potentially severe conflicts.

4.3.5. Shamdoley Chiwog

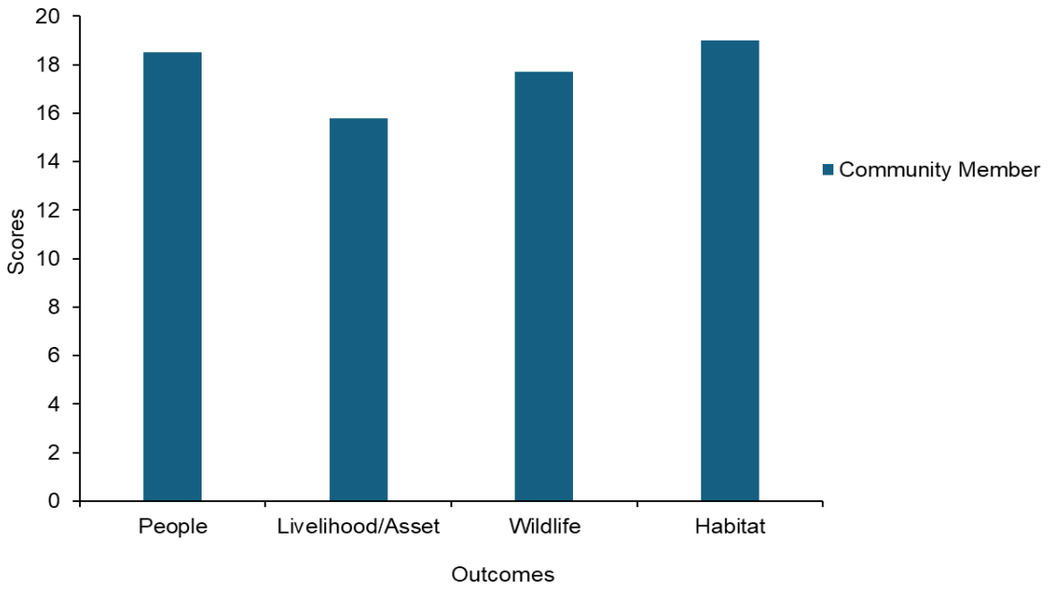

Figure 21. Graphical presentation of result by Outcomes for Shamdoley chiwog

The graph (Figure 21) highlights that Livelihood/Asset is the most affected outcome of HWC in Shamdoley Chiwog, as indicated by its shortest bar, reflecting significant economic losses from crop destruction, livestock predation, and property damage, which directly threaten the community's financial stability and food security. While the impacts on People, Wildlife, and Habitat are slightly lower, they remain significant, with risks to human safety, challenges in wildlife conservation due to potential retaliation, and concerns over habitat degradation and fragmentation. Addressing these issues requires targeted mitigation measures such as crop protection, livestock insurance, and sustainable land-use practices, alongside strategies that promote long-term coexistence between humans and wildlife.

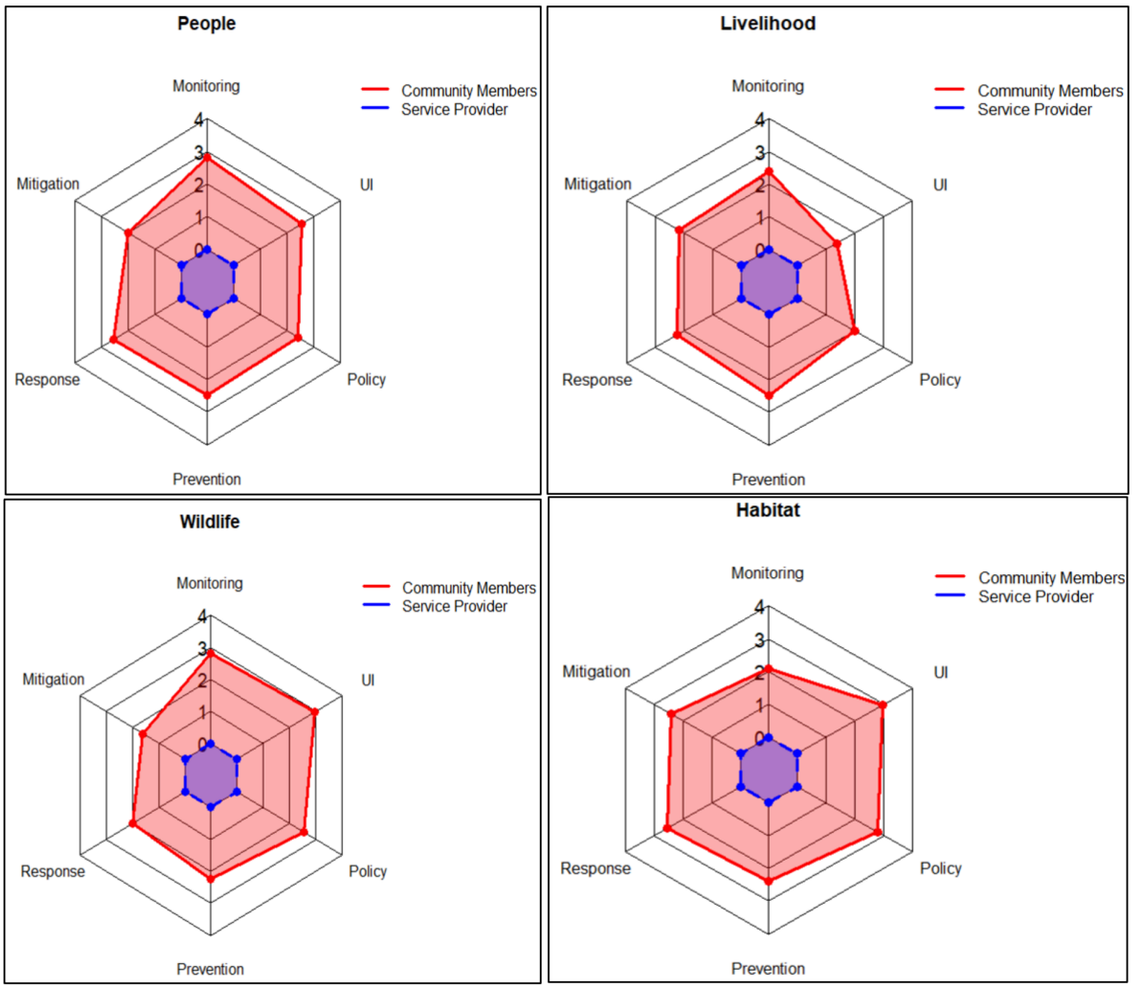

Figure 22. Graphical presentation of result by elements for Shamdoley chiwog

The graphical data (Figure 22) underscores monitoring, mitigation and UI as critical focal areas across all elements of the outcomes—People, Livelihood, Wildlife, and Habitat—in addressing HWC. The lower scores for these parameters indicate higher levels of impact, suggesting deficiencies in tracking conflict events, implementing mitigation measures, and minimizing adverse outcomes. Insufficient monitoring limits the ability to anticipate and respond effectively to conflicts, while inadequate mitigation exacerbates socioeconomic vulnerabilities, threatens wildlife populations, and degrades habitats. Enhancing monitoring systems and developing robust mitigation strategies are essential to reducing conflict intensity, safeguarding livelihoods, preserving biodiversity, and fostering sustainable human-wildlife coexistence.

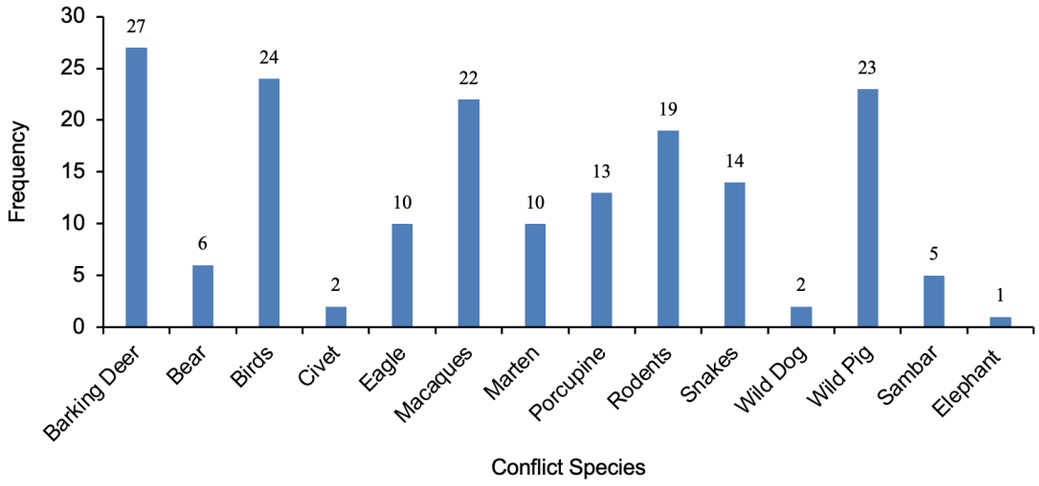

Figure 23. Primary Conflict Species of Shamdoley chiwog

The frequency of conflict species within Shamdoley chiwog (Figure 23) indicates that barking deer and wild pigs are the most significant contributors to human-wildlife conflict, with incident frequencies exceeding 20, likely due to their tendency for crop depredation and habitat encroachment. Moderate conflict levels are associated with rodents, macaques, and porcupines, reflecting their substantial impact on agricultural and property resources. In contrast, species such as bears, civets, and snakes exhibit lower conflict frequencies, while eagles, elephants, and sambar deer have minimal involvement. These findings emphasize the need for species-specific conflict mitigation strategies, prioritizing high-frequency species to reduce resource losses and foster sustainable human-wildlife co-existence.

5. Conflict to Coexistence Strategy

The assessment of HWC facilitated a series of focused group discussions (FGDs) across five chiwogs, engaging 224 participants (124 males and 100 females). These discussions identified priority activities and served as a foundation for collaborative planning. Co-design, as a methodological approach, was central to this process. It emphasizes structured, participatory development that engages stakeholders equitably to analyze issues, share experiences, and develop responsive solutions. Unlike traditional needs-based models, co-design leverages community assets and expertise to co-create practical and culturally aligned interventions.

Co-design is particularly valuable in conservation programming, where long-term success requires durable partnerships and inclusive participation. By involving stakeholders in all phases of planning and implementation, this approach fosters adaptive strategies that evolve with the community's needs. Engagement in co-design goes beyond consultation; it builds trust and empowers communities as equal contributors. This ensures that conservation measures, such as those addressing HWC, are context-specific and reflect the lived experiences of those most affected.

The iterative C2C framework embodies co-design principles to manage HWC sustainably. The approach encompasses distinct stages: context and stakeholder analysis, HWC assessment, collaborative strategy development, implementation, and adaptive monitoring and evaluation. Each phase informs the next, ensuring culturally relevant and scientifically sound outcomes. By embedding co-design in HWC management, stakeholders collaboratively foster coexistence between humans and wildlife, laying the groundwork for lasting conservation success.

The methodology by which the actions and products described above weave together in an iterative process to ensure effective and sustainable HWC management. The outcomes of the co-design process were presented to the relevant sectors and agencies at the Dzongkhag level. These findings were subsequently prioritized and integrated into the strategy, as detailed in the table below. The total budget outlay for the 5-year C2C strategy plan (2025–2029) for Tashiding gewog is projected at Nu. 32.1 million.

Table 4. Implementation Plan and Financial Outlay

Outcome	Activities/Action	Location	Category	Responsibility		Budget Estimate (Nu in Million)	Source of Fund	Timeline
				Lead	Collaborators			
Livelihood/ Assets	1.1. Install High Quality Electric fencing (strong & high poles)	Ganjab	Short term	Dzongkhag Agriculture sector	Community	1.2	WWF	2025 - 2028
	1.2. Provide equipment for QRT members (raincoats, gum boots, quality torches)	Ganjab	Short term	DoFPS	community	0.5	RGoB	2025 - 2028
	1.3. Establish Plantation of Red sandalwood and Teak	Ganjab & Norbuling	Long term	DoFPS	community	3	RGoB	2025 - 2029
	1.4. Install Electric fencing	Namchella, Tashiding & Shamdoley	Short term	LG, Dzongkhag Agriculture sector	Community & LG	6	WWF	2026 - 2028
	1.5. Provide financial support for Piggery farms	Tashiding	Short term	LG, Dzongkhag Livestock sector	Community	8	Livestock	2025
	1.6. Provide Alternative crops (oranges, ginger, banana)	Namchella	Long term	Agriculture & LG	Community	2	RGoB	2025 - 2029
	1.7. Install Chain link fencing	Tashiding & Norbuling	Short term	Dzongkhag Agriculture sector	Community	6	RGoB	2024- 2025
Habitat	2.1 Establish plantation of fruit trees in the nearby SRFL	Tashiding, Namchella & Shamdoley	Long term	DoFPS	Community	4	RGoB	2025 - 2029
People	3.1 Conduct Awareness programs on policies, rules and regulations, wildlife, HWC, Wildlife encounter safety	Namchella	Short term	DoFPS	LG	0.5	RGoB	2026 - 2028
Wildlife	4.1. Enhance SMART Patrolling	All five Chiwogs of Tashiding	Short term	DoFPS	Community	0.9	RGoB	2025 - 2029

6. Monitoring and Evaluation

Timely monitoring and evaluation of planned programs are essential to ensure the successful achievement of intended objectives. This section describes the approach for tracking and assessing the implementation of strategic actions. A detailed Monitoring and Evaluation (M&E) plan, as presented in Table 4: Monitoring & Evaluation Framework, has been designed to align closely with the Implementation Framework. The plan incorporates specific indicators to evaluate the strategy's performance, offering a transparent basis for measuring progress. Output indicators will focus on assessing the accomplishments of the actions outlined in Section 4, promoting accountability and enabling continuous refinement during the implementation process.

6.1 Monitoring

Monitoring is a continuous evaluation process designed to offer stakeholders timely and comprehensive updates on the progress or setbacks of activities, ensuring transparency and clarity about their implementation status. For the 5-year strategic plan, the DFO Dagana will carry out annual monitoring to assess progress, address challenges, and ensure that planned actions remain aligned with the intended objectives.

6.2 Evaluation

The Strategy will be evaluated twice during its implementation period to ensure its effectiveness and alignment with the set objectives. A mid-term review will occur in the final quarter of the second year, followed by a final review in the last quarter of the fifth year. These evaluations will be conducted by a joint team comprising internal members from DFO, Dagana and external representatives, including officials from the concerned Functional Division. This approach ensures a thorough and unbiased assessment of the plan's implementation and outcomes.

Table 5. Monitoring and Evaluation Framework

Outcome	Action	Action Indicator	Baseline	Unit	Yearly Target				
					2025	2026	2027	2028	2029
Livelihood	1.1 Install high quality Electric fencing (strong & high poles)	Area of agriculture land fenced at Ganjab	0	Area (ha)	-	4	2	2	2
	1.2 Provide equipment for QRT members (raincoats, gum boots, quality torches)	No. of QRT equipment procured and provided to the QRT members of Ganjab	200	No		-	0	-	200
	1.3 Establish Plantation of Red sandalwood and Teak at Ganjab & Norbuling	No. of seedlings provided		No		1000	1000	1000	1000
	1.4 Install Electric fencing	Namchella, Tashiding & Shamdoley	3.6	km	0	0	3	3	0
	1.5 Provide financial support for Piggery farms	No. of households provided with financial support for piggery farms		No		10	10	10	10
	1.6 Alternative crops (oranges, ginger, banana)	No. of seedlings provided		No		200	200	200	200
	1.7 Install chain link fencing	Length of Chain link fencing installed		km		2	2	2	2
Habitat	2.1 Establish plantation of fruit trees in the nearby SRFL	Area of SRFL where plantation of fruit trees is established		Area (ha)		2	6	2	4
People	3.1 Awareness programs on policies, rules and regulations, wildlife, HWC, Wildlife encounter safety	No of awareness created	2	No. of times		1			1
Wildlife	4.1 Enhance SMART Patrolling	No. of patrols conducted		No	11	11	11	11	11

7. Conclusion

Key findings from the C2C assessment and community consultations highlight the complex interplay between wildlife conservation and rural livelihoods, highlighting critical issues like crop and livestock depredation, habitat degradation, and economic vulnerabilities. The C2C Strategy for Tashiding Gewog is a comprehensive, community-driven approach to addressing HWC. This strategy is rooted in participatory methodologies and effectively integrates local knowledge, stakeholder insights, and scientific assessments to develop culturally relevant and sustainable solutions.

The approach guarantees inclusivity and a thorough grasp of community dynamics by involving a broad population, which includes almost equal representation of men and women as well as a range of educational backgrounds. Targeted interventions, such the installation of chain-link and electric fencing, the encouragement of alternative crops, and habitat restoration projects, were made easier by the organized co-design approach, which also placed a strong emphasis on capacity-building through enhanced monitoring systems and awareness campaigns.

The C2C framework emphasizes how crucial it is for local leaders, conservation organizations, and community members to work together and share responsibilities. The results of this approach not only lessen HWC but also promote harmony between wildlife preservation and human livelihoods, opening the door to coexistence. This model can be used as a template to solve HWC in Bhutan and other similar socio-ecological environments.

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Annexure : C2C Tool 4: Context Screening Form for C2C: Conflict to Coexistence-Approach

Overview of Categories:
1. Landscape / Site description: demographics, geography, threats, stakeholders,
2. Human-wildlife conflict trends: type of conflict, frequency, conflict species
3. Drivers of conflict: Anthropogenic drivers, natural drivers
4. Social dynamics: social carrying capacity, community heterogeneity
5. Wildlife dynamics: species population, movements, behaviors
6. Policy: legal instruments, management mechanisms

Screening:
Before completing this screening format, collect all baseline information on the landscape/site (previous assessments, reports, published literature, social landscape mapping if completed, etc.).
** All information below might not be known/available/collected – fill out all available information. In case information is not available mark "NN"

1. Landscape/Site description for the area C2C: Conflict to Coexistence-Approach will be implemented in

Category	Example	Information/Details	Reference (Source of information)
1.1 Name of landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	e.g., Ruvuma; Terai Arc Landscape; Tawau, KAZA TFCA	Trashiding 412-households	NSB
1.2 Country	e.g., Nepal; Gabon; Tanzania	Bhutan	
1.3 Administrative division (Province, State, District etc.)	Chitwan District; Province de l'Ogooué-Maritime; Namtumbo and Tunduru districts	Dagana district	
1.4 Area/size of the landscape or site (km^2)	e.g., 100 km2	39.53 km2	
1.5 Name/Proportion protected area (include type of PA/OECM) within the landscape	e.g., Nyungwe National Park (25% of landscape), Volcanoes National Park (10% of landscape), etc.	NN	
1.6 Dominant land use type within site or landscape	e.g., National Park; Villages; Rangelands; Agroforestry	Agroforestry	
1.7 Human population (number of residents and density) in the landscape or site - and population trend	e.g., 5000 residents in village Xy, 50 per sq km, increasing population; 2500 residents in village Xy, 50 per sq km, decreasing population	2300 individuals	
1.8 Location of Communities within the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	e.g., One community within national park, one community outside of national park	Five chiwogs under Tashiding Geog	

1.9 Community demography (age, gender, education, income) in landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	e.g., any available census data - 52% female, 48% male - 10% over 50, 40% 30-50, 50% under 30 - 85% of residents have primary level education, 50% secondary level - mean income level, etc. etc.	843 male, 844 female	NSB
1.10 Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities resident in landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	e.g. Sami, Inuit, Khoisan, etc	NN	
1.11 Ethnic groups/castes resident in landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	Orang Asli, Brahmins, Adivasi, etc	Kheng, Tshangla, Tamang, Ngalops	
1.12 Proportion of people living in poverty landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	e.g., 30% of residents live below poverty line (as defined for the region)	NN	
1.13 Faiths/Religions of people living in poverty landscape or site where C2C: Conflict to Coexistence-Approach will be implemented	Buddhist, Islam, etc	Hindu and Buddhist	
1.14 Main community livelihood activities in the landscape (including livestock type, crop type, etc.)	e.g., livestock production (cattle, sheep), crops (corn, soybeans),	livestock production(pigs, cattle, goats), crops (rice, corn, beans,)	
1.15 Non-consumptive tourism activities	e.g., photo tourism, visiting NP, hiking, rafting, camping	NN	
1.16 Consumptive tourism activities	e.g., trophy hunting, fishing, mushroom collection	NN	
1.17 Other important site information		NN	

2. Human-wildlife conflict trends

Category	Example	Information/Details	Reference (Source of information)
2.1 Which wildlife species cause negative interactions with people in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented (conflict species)	e.g., elephant, lion, wild boar	Monkeys, deer, porcupines, wild boars, squirrels, Marten, Eagle, Great Treepie	Secondary data
2.2 Conflict animal characteristics (sex, age, hierarchy, etc., if known) in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g., if there is problem animal or animals could list their characteristics here: bachelor young male elephant	Adult, pack, solitary, nocturnal	Field observation
2.3 Description of physical damage (crops, livestock, other property) caused by wildlife species in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g., elephants damage maize and vegetable gardens lions kill livestock at pastures wild boar damage vegetable gardens	Deer damage beans and millets Wild boars damage maize squirrels damage orchards Marten and Eagle attack poultry Porcupines damage vegetable	Field observation/SMART data
2.4 Severity of conflict (number of lethal conflicts for wildlife and people)	e.g., 1 lethal conflict resulting in death of human in year 2022, 1 retaliatory killing of lion in 2023	1 hunting case of Wild Pig (Sus scrofa) in 2023. 19 goats were lost to dholes at Tashiding in the year 2024.	SMART Data
2.5 Frequency of conflict (number of conflict incidents* over 12 months)	e.g., 12 incidents of livestock predation and 30 crop damage incidents over past year	The cases of HWC is frequent in the ground reality. However, the farmers usually do not report the cases as there are no compensation they get in return. The farmers report the cases when it is severe such as when large numbers of domestic animals are lost to predators or when the conflict threaten their lives or property.	
2.6 What HWC-related data is available for the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented and how is it gathered?	e.g. Monitoring data by forest department, based on reports/ claims of farmers	Geog HWC baseline data and through SMART.	
2.7 Is HWC increasing, stable or decreasing in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g. Increasing crop damage by elephant and wild boar reported from villages in area xx, but overall increasing number of human fatalities.	Though the human fatalities were not reported in the past, there are cases of crops and property damaged by the wildlife especially by elephant at Ganjab.	SMART Data
2.8 Which HWC hotspots have been identified in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g. 3 villages (name1, name2, name3) in district xx, have been identified based on frequency and severity of HWC	Ganjab, Norbuling and Tashiding are identified as the HWC hotspot areas based on the severity of the conflict. For instance, elephant -human conflict exists at Ganjab. Crop loss is high in Norbuling and Tashiding to wild ungulates and primates.	

2.9 Description of intangible costs caused by wildlife in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g. behavioral adjustments; heavy workload through guarding practices; exposure to other risks; fear	Guarding of farmland Installation Scare crows Sound repellants	
2.10 Level of tolerance of communities towards wildlife (e.g., attitudes or behaviors) in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g., high tolerance for herbivores, low tolerance for lions	Medium tolerance for herbivores (few cases of snaring)	
2.11 HWC management methods implemented in the past or currently being implemented (e.g. technical, financial or social strategies to prevent, reduce or mitigate HWC) in the landscape or site.	e.g., fences around rangelands, guard donkeys/dogs used, deterrents in use, guarding, conservation performance payments, awareness programs, community HWC response teams, early warning systems	Quick response team formation, chain link and electric fencing, awareness, helping to chase/ drive wildlife away	Field observation
2.12 Have any of the HWC management methods listed above failed in the past? If yes, please elaborate on the barriers to success.	e.g. the electrical fence constructed 5 years ago was damaged, due to low buy-in of community and insufficient maintenance	Chain-link fence installed few years ago at Ganjab was damaged by Elephant and due to insufficient maintenance.	Field observation
2.13 Other important information on HWC trends.		NN	

3. Drivers of conflict

Category	Example	Information/Details	Reference (Source of information)
Anthropogenic drivers			
3.1 Which changes in land cover/use have been observed in the past years in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g., in the past 10 years (from 2012) 30% of the natural forest in the buffer zone of xx NP has been cleared for rangeland; in 2020 a palm oil plantation has been converted into a forest corridor between NP1 and NP2	Electrical transmission lines Feeder road construction Infrastructure construction	
3.2 Which developments have impact on connectivity for wildlife in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g., settlements or development in corridors, infrastructure fragmenting habitat	Roads Infrastructure construction	
3.3 What attractants are found for wildlife on community-lands?	e.g., food (fruit trees, crops), light, heat, garbage dumps	Crops and fruit trees	
3.4 How is hunting regulated in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented and which local hunting practices exist?	e.g., hunting is not permitted in landscape	Hunting is not permitted in landscape(as per fncrr,2023 and penal code of Bhutan)	
3.5 Illegal hunting trends	e.g., illegal hunting of small prey species common	SMART and FIRMS data	
3.6 What types of land rights are found in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g. legal land rights, illegal land use, traditional land rights, etc.	Wetland, dryland and forests	

3.7 Other anthropogenic drivers	e.g., any other anthropogenic drivers not listed here?	Collection of NWFPs, unsustainable forest produce harvest and Policies	
Natural drivers			
3.8 How does or could climate change impact on HWC?	e.g., longer dry season leading to drought conditions	Drought, non-native species, drying of lakes and water source	
3.9 Which landscape features (topography) of the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented influence behavior, movement and dispersal of wildlife (and people)?	e.g., river along part of national park border (dry conditions make this river crossable)	Presence of uncrossable rivers like Sunkosh and Dagachu along the boundary of Tashiding Geog may have kept the wildlife trapped in this landscape.	
3.10 Are natural food and water sources sufficient for the wildlife species in conflict in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g., river in national park provides sufficient water year-round, prey abundance sufficient for tiger population	There are 24 water sources in the landscapes. However, all of them in drying stage due to climate change and developmental activities. Currently, Tashiding Geog has only one drinking water source which is identified as HCV by DoFPS and protected. Almost all water sources such as streams are seasonal. This situation may have led to human-wildlife conflict as the water were tapped.	National Water sources data 2021.
3.11 How do forest fires impact on wildlife and what are fire trends in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g., annual bush fires are natural but number and severity of fires has been increasing in past 5 years.	NN	
3.12 Other natural drivers	e.g., any other natural drivers not listed here?	NN	

4. Social dynamics

Category	Example	Information/Details	Reference (Source of information)
4.1 Which surveys/research to capture social aspects related to HWI have been conducted in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g. social dynamic study; community knowledge and perceptions; media study; stakeholder assessments, social landscape map	CVCA/HWC surveys conducted in 2023 /SMART data	
4.2 Which power dynamics between stakeholders are observed in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g. Conflict of interests between stakeholder groups, Stakeholder groups influencing/polarizing, rivalry between stakeholder groups, high level of escalation	NN	
4.3 Any other information/observation regarding social dynamics in the area?		NN	

5. Wildlife dynamics

Category	Example	Information/Details	Reference (Source of information)
5.1 Conflict species relative abundance/ density in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g., estimated abundance of 55 elephants in national park and 30 lions	Refer smart data and FIRMS	
5.2 Population trends of conflict species in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented.	e.g., increasing population of elephants, decreasing population of lions (could include specific population numbers if known)	Study on Least concern species (refer focal)	
5.3 Population trends of prey species (in case carnivore conflicts are observed)	e.g., decrease in small ungulate species (could include specific population numbers if known)	NN	
5.4 Which wildlife movements through the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented, are observed	e.g. elephant migrate through community land between national parks in the dry season; crocodiles gather in specific waterholes during months xx-xx; baboons pass xx fields in morning hours	Due to the change in availability of food resources in the forest in response to the season, the wild animals encroach the farmland for food resources. Indeed, the wild animals choose easer source of food from the farmlands in the proximity of their habitats.	
5.5 Has any type of behavior by specific wildlife species or individuals been observed that may point at learned behavior or that might be specifically challenging? Please provide details.	e.g., Individuals of elephants use tusks to lift up electric fence wires; wolf jumps over specific fences; hyena follows wild boar under barrier; primates learned to unlock doors	Resistant to sound produced using bamboo	
5.6 Which changes of wildlife behavior, movement or dispersal have been observed in the past years in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g., troops of primates found close to NP boundary more often; elephants moving out of NP in evening and returning during day, stronger activity of deer at night	Monkeys and bird diurnal and deer, porcupine and mice nocturnal	
5.7 Other important wildlife-related information that impacts on human-wildlife relationship		Habitat destruction	

6. Policy, governance and institutions

Category	Example	Information/Details	Reference (Source of information)
6.1 List of policies related to HWC or HWC management relevant for the landscape	e.g., Law 153B no killing of protected species (elephant, lion), Policy #453 land use policies within community land, etc. etc.	Prohibited killing both by religion and by law of the country	
6.2 List of SOPs or other operational regulations/documents relevant for managing the interaction of wildlife and people	e.g., SOP on rapid HWC response; decision support system for problem animal control	Rescue team (LG, forestry officials, livestock officials)	
6.3 Which administrational and other governance structures are in place in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented that relate to HWC and coexistence?	e.g. district level HWC reporting scheme; natural resource boards operating fence maintenance; conservancy board involved in HWC monitoring; landscape level platform/ forum on HW coexistence	NN	
6.4 Which governmental, non-governmental and private institutions are active in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?		RSPN, DoFPS & WWF	
6.5 Which funding sources for managing HWC and developing HW coexistence strategies are currently available in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?	e.g., WWF, local government, etc.	WWF and Local government (GOI)	
6.6 Which staff capacity is available to be engaged in HWC management and human dimensions of conservation work?	e.g. HWC focal person, staff with background in social sciences	DoFPS, Moal, LG & Schools	
6.7 Which lead group is expected to manage HWC in the landscape or site where C2C: Conflict to Coexistence-Approach will be implemented?		DoFPS and LG	