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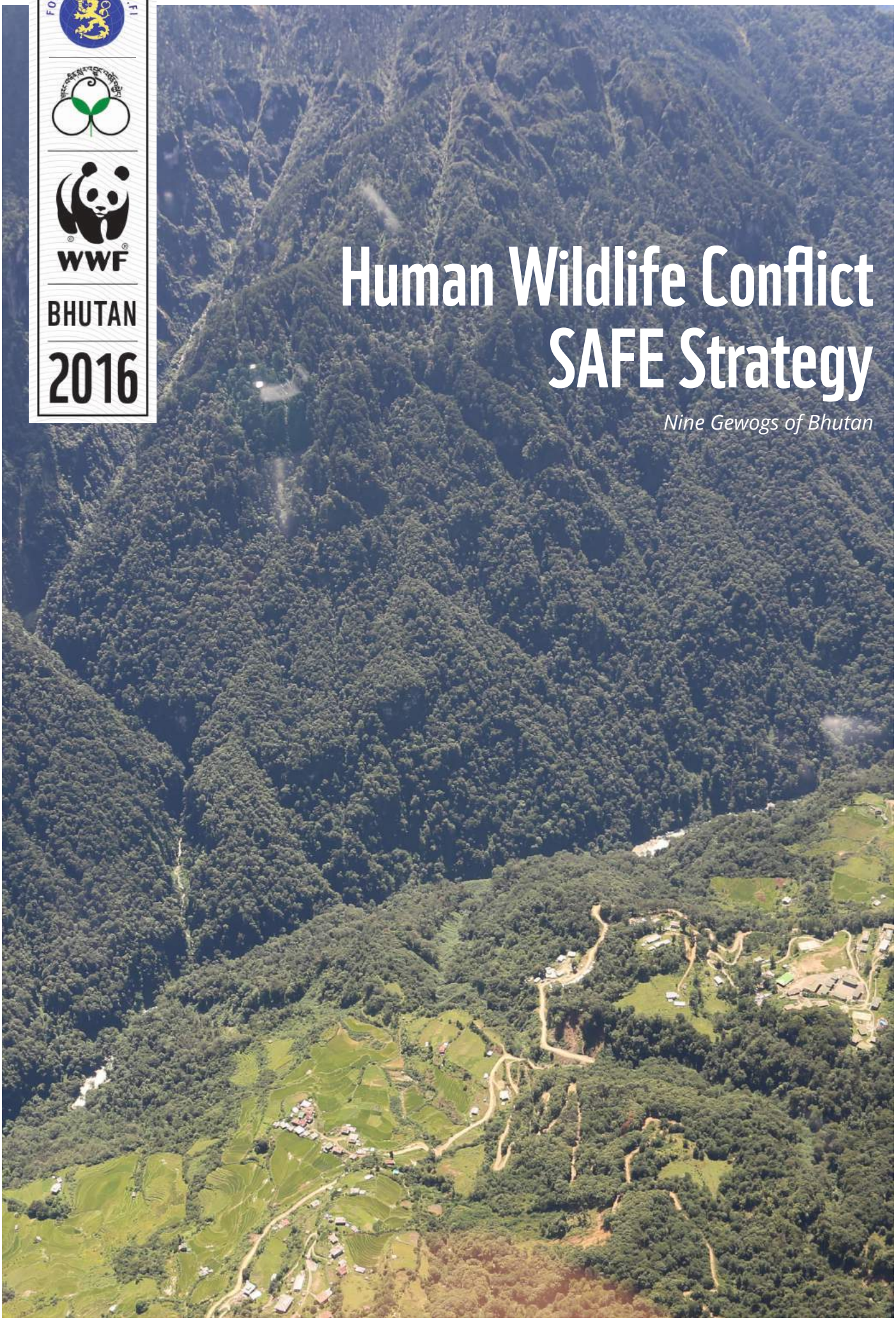
2016

Human Wildlife Conflict SAFE Strategy

Nine Gewogs of Bhutan



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CONTENTS

FOREWORD

Minister, Ministry of Agriculture and Forests

Bhutan celebrated the three most important occasions in 2016: the birth of the Gyalsey; the 400th anniversary of Zhabdrung's arrival in Bhutan; and the birth year of Guru Rimpoche. Coinciding with these three occasions, the National Plant Protection Centre under the Department of Agriculture and with the technical support from WWF-Bhutan piloted the Safe System (SS) approach to human wildlife conflict (HWC) management in the country. The ministry is honored to bring forth the report on the SS approach titled "Human Wildlife Conflict SAFE Strategy: Nine Gewogs of Bhutan." I am immensely pleased to present this report.

In Bhutan, HWC is a recurrent and a complex issue that plays out and is deliberated over at all levels, from the lowest local government to the highest national assembly. It also repeatedly occurs in the local media and national news. Numerous interventions have been researched, tested and implemented in the field with some degree of success. Of late, electric fencing has been widely used to deal with crop depredation across the country. However, all these interventions serve as temporary solutions with a focus only on prevention and mitigation. The nature of HWC - transcending agriculture, forestry, livestock and conservation – necessitates holistic and long-term solutions. The SS approach of HWC answers this call.

As such, SS of HWC is a new holistic management approach and considers development of long-term solutions in a landscape. It is a suite of actions across six elements: policy and legislation, mitigation, prevention, response, monitoring and understanding the conflict. Each element contributes to a single long-term goal for an area; to make an area safe: safe for people, assets, wildlife and habitat. This new approach of HWC management was piloted in nine Gewogs of Bjenag, Ruebisa, Saephu, Draagteng, Phangkhar, Tangsibji, Nubi, Langthil and Kengkhar spanning four Dzongkhags of Mongar, Zhemgang, Trongsa and Wangduephodrang.

The rapid assessment of HWC that was conducted as a part of SS approach in the aforementioned nine Gewogs reveal that overall, wildlife (59%) and habitat (56%) are safe in Bhutan. This may be a reflection of the strong policy and legislative foundation for the environment and conservation nationally. However, the other outcomes of the SS approach – people (33%) and assets (31%) are relatively unsafe. In addition, there is a weak monitoring (22%). The reports on increased depredation of crops and human casualties may be attributed to unsafe people and their assets and lack of monitoring. Accordingly, in consultation with stakeholders, strategies were developed to enhance the safety of each element.

To this end, I would like to congratulate the National Plant Protection Centre, the Department of Agriculture and WWF in bringing forth this extremely important strategy to address HWC in Bhutan. Together, I also would like to thank all the participating Dzongkhags and Gewogs for rendering support during the rapid assessments. It is my hope that the strategy will be successfully implemented during the 12th five year plan and create safe environment for people and their assets, wildlife and their habitats and live in harmony with nature and enhance gross national happiness. My very best wishes.

Trashi Delek

Lyonpo Yeshey Dorji
MINISTER

Message from the Secretary

Agriculture, forestry and livestock are three most important sectors in Bhutan. They are the source of income and livelihood for about 90% of population. However, human wildlife conflict (HWC), is a growing threat to the country's move towards poverty alleviation and food insecurity reduction. It is also a threat to the success of conservation.

In the fight against wildlife damages, people in Bhutan have used various measures such as night guarding, banging cans, scarecrows, dummy tigers, etc within their means and reach. The National Post Harvest Centre developed sound and light repellents. Of late, electric fencing has become the most widely used prevention measure in the country. While all these provided temporary solutions to the problem, there is a need for a long-term strategy to address the HWC problem in the country.

The Safe System approach of WWF, which is holistic and long-term, seeks to address the current shortcomings of HWC in Bhutan. The approach intends to create safe environment for both people and their assets and wildlife and their habitats in a landscape for their harmonious co-existence. The approach was piloted in nine Gewogs in four Dzongkhags. One of the activities of the pilot project was to conduct rapid assessment of HWC in these nine Gewogs. This report is based on the results of the rapid assessment.

The results from the rapid assessment reveal that while wildlife and their habitats are safe, people and their assets are unsafe in Bhutan. There is a need for actions across the six elements of Safe System approach to bring about safe people, safe assets, safe wildlife, safe habitat and improved monitoring. Accordingly, in consultation with the stakeholders from the Dzongkhags and the Gewogs, strategies were developed.

It is my hope that the strategies developed will be implemented during the 12th five year plan with financial support from the donors and help Bhutan maximize Gross National Happiness and attain harmonious co-existence with wildlife and nature. I thank the National Plant Protection Centre, Department of Agriculture, WWF and other stakeholders involved with the Safe System approach for bringing forth this report.

Trashi Delek!

Rinzin Dorji
SECRETARY
Ministry of Agriculture and Forests

Message from the Country Representative
WWF Bhutan

This report on Human Wildlife Conflict SAFE Strategy is a result of WWF's year-long partnership with the National Plant Protection Centre, Ministry of Agriculture and Forests, to address the emerging issues and concerns of human-wildlife conflict and food security.

In March 2016, we began preparing a long-term holistic and innovative solution to human-wildlife conflict (HWC), a critical issue for Bhutan where more than 60% of the population directly rely on livestock and crop production for livelihoods. The loss of crops and livestock in poor rural areas can have a devastating impact to households, while the retaliatory killing of wildlife is a challenge to long-term conservation and maintenance of national biodiversity. Hence, the Human-Wildlife SAFE System approach - that involves making the system (people, wildlife, assets and habitat) safe - was introduced in four districts with an ambitious plan to scale the lessons learned at the national level.

In close collaboration with the Royal Government and other stakeholders, we were able to conduct HWC SAFE system rapid assessment of nine gewogs in Mongar, Wangdue, Trongsa and Zhemgang districts. Given the complexity of HWC, the issue warrants evidence-based and integrated solutions and therefore, this report not only captures the status of how safe are our people, wildlife, assets and habitat but also provides numerous recommendations.

In fact, as one of the first nations to test the HWC SAFE system, the knowledge generated from the assessment has enabled us to develop a strategy to improve HWC management, and safeguard our rich biodiversity and livelihoods of local communities. Recommended actions are grouped into five different conflict elements: Policy, prevention, mitigation, understanding the conflict and response and monitoring. In addition, about 65 km of electric fencing was provided to the four districts' HWC hotspots as an interim prevention strategy.

We would like to thank our partners, especially the Ministry of Agriculture and Forests, and stakeholders who have been part of this process for their valuable contributions. The Human-Wildlife SAFE System Approach is to address all issues; recognizing the human dimensions of human-wildlife conflict; to rapidly mitigate urgent wildlife problems; and to prepare strategies that will ensure safety of human and their assets, wildlife habitats and wildlife itself in longer term. This HWC exercise will be important in guiding Bhutan on its path towards sustainable growth and development.

We now look forward to our partners' support in implementing the recommendations in the report and work towards a robust HWC management strategy with practical nationwide solutions. Thank You.

Dechen Dorji
COUNTRY REPRESENTATIVE
WWF Bhutan

2 INTRODUCTION

Bhutan is predominantly an agrarian society with more than 60% of the population relying on agriculture for income and livelihood. Of these, 90% of the population lives in rural areas. Primary agricultural activities include crop production, livestock rearing and collection of non-timber forest products (NTFP). In a country where agriculture serves as the back bone of the economy, conflict between the people and wildlife is invariably present. In Bhutan, human wildlife conflict (HWC) is a major constraint to the country's agricultural sustainability, national food security and has caused social disharmony. This was first reported by Wollenhaupt in 1991. Since then the issue has become a national concern and frequently deliberated by parliament and local meetings.

The most commonly cited conflicts between humans and wildlife in Bhutan are crop depredation, livestock predation, attacks on humans, and wildlife straying too near human settlements. Crop depredation is the most common form of HWC cited in Bhutan. Less cited but important aspects of HWC are the hidden or opportunity costs associated with guarding, forgoing activities due to fear, psychological disturbance, transaction costs incurred when pursuing compensation, family disruption, livelihood and food insecurity due to crop and livestock loss and increased debt and aggravation of pre-existing poverty.

Reports from various sources mention HWC as the main constraint for agricultural production (Maetz *et al*. 2012, DoA 2013, DoA 2014, PPD 2015). For instance, 24.6% of the farmers mention HWC is a constraint in technology adoption, agricultural productivity and road infrastructure in Bhutan (Bart *et al*. 2010). The Rapid Impact Assessment of Rural Development mentioned that 35% of the respondents who faced food shortages, 31% of them cited wildlife damage to crops as one of the main causes (Planning Commission 2007).

The Safe System approach of human-wildlife conflict management in Bhutan will contribute towards achievement of sustainable development goals (SDGs). Of the 17 SDGs identified globally, Bhutan has prioritized 3 SDGs:

- Goal 1 – no poverty (end poverty in all its forms everywhere);
- Goal 13 – climate action (take urgent action to combat climate change and its impacts); and
- Goal 15 – life on land (protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

The Safe System approach will contribute towards achievement of Goal 1 and 15 of Bhutan. At the international level, it will contribute to Goal 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture).

The Safe System approach will also contribute to the achievement of the 12th five year plan (FYP) from 2018-2023. The Government of Bhutan is in the process of preparing the 12th FYP with an objective to create "just harmonious and a sustainable society through enhanced decentralization." As per the 12th FYP, a "just society" is defined as a "society where every citizen has equitable access to resources and opportunities to pursue and realize individual and national aspirations" and one of the priorities to achieve this is by eradicating poverty. A "harmonious society" is defined as a "society where every individual lives in harmony with oneself; with community; with nature; and with culture and traditions. While a "sustainable society" is to be created by ensuring water, food and nutrition security.

2.1 Objectives

- To conduct Rapid Assessments for HWC following the Safe System approach
- To develop HWC Strategies for nine Gewogs

2.2 Methodology

In order to comprehensively capture the context of HWC across the target sites, the HWC SAFE System Rapid Assessment tool (Refer Section 5 for details) was employed across nine Gewogs, within four Dzongkhags (Figure 1). The program of work on HWC is supported by WWF, under its "Human wildlife conflict management and improving food security in Bhutan project" in partnership with the National Plant protection Centre (NPPC), Ministry of Agriculture and Forests and Ministry of Foreign Affairs (MFA), Finland.

Target Dzongkhags were selected based on HWC criteria of severity and vulnerability:

- crop loss, livestock depredation, and human casualty;
- poverty level;
- presence and absence of projects; and
- area covered by solar/ electric fencing.

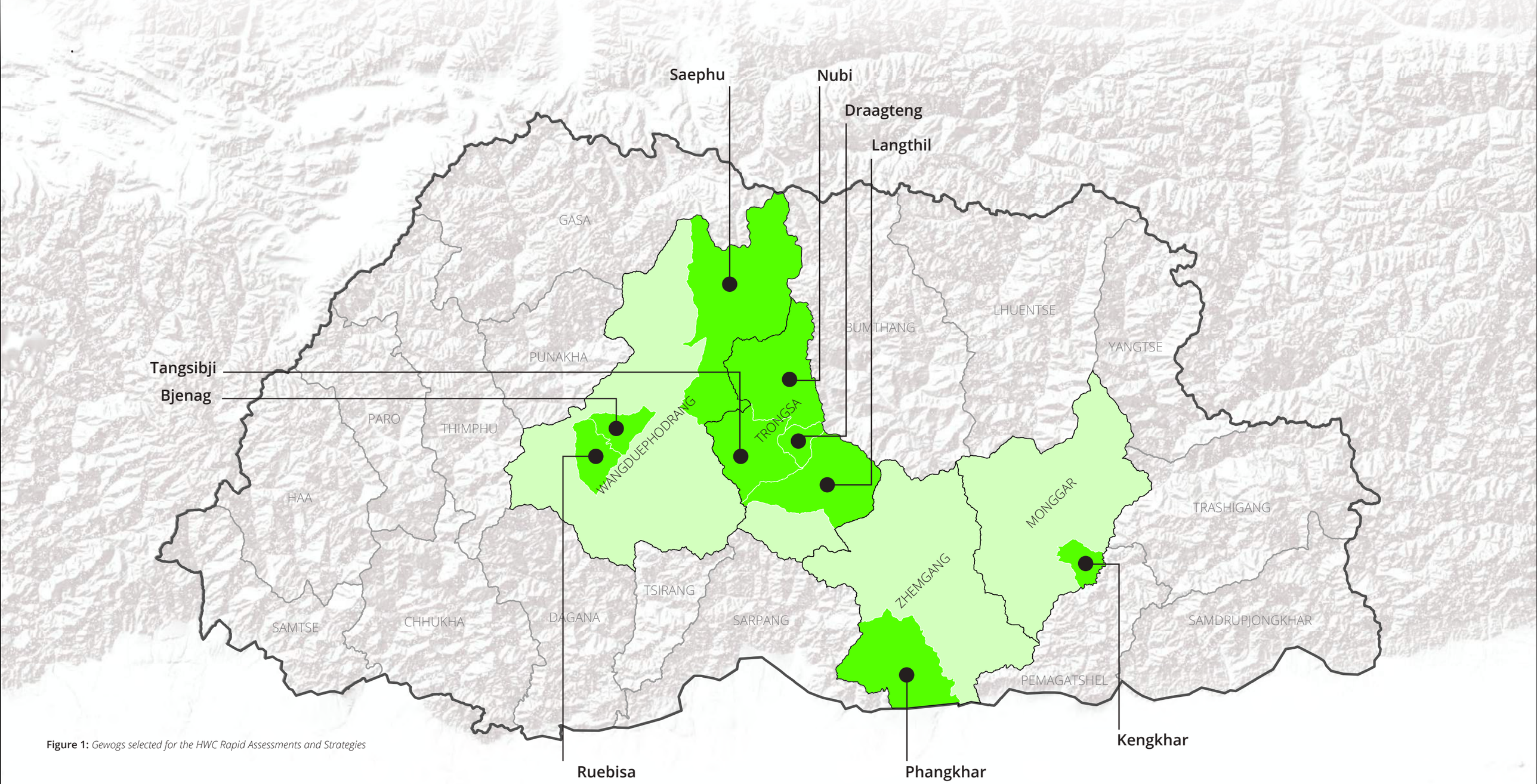


Figure 1: *Gewogs selected for the HWC Rapid Assessments and Strategies*

The Gewogs and target villages within each Dzongkhag were selected in consultation with the District Agriculture Officers (DAO) of the selected Dzongkhags. The Gewogs and villages were also identified using the same criteria for severity and vulnerability to HWC.

Prior to SAFE System Rapid Assessments at each site, a one day training was conducted in collaboration with NPPC, Semtokha, under the Department of Agriculture (DoA). The training was facilitated by Dr. Ashley Brooks and a total of 34 Renewable Natural Resource (RNR) staff participated. During the training, participants were introduced to the SAFE System approach and trained on how to conduct SAFE System Rapid Assessments.

Each HWC Rapid Assessment was carried out over a three day period with participants from Renewable Natural Resource (RNR), Druk Green Power Cooperation (DGPC) and Local Government (LG), followed by one-day community consultation meetings with farmers from the selected Gewogs.

The three day Rapid Assessment workshops involved a half day introduction to the SAFE System Approach to HWC, followed by systematic assessment of HWC context within the Gewog. The assessment is based on minimum criteria for HWC interventions, is able to capture SAFE Baselines for HWC at the site. It also captures where the key gaps in HWC interventions are across the area (Refer Appendix 1 for detailed HWC Rapid Assessment questions and criteria used). Based on the results of the SAFE Rapid assessments, SAFE strategies and interventions were developed for each site. Using the results, monitoring indicators were also developed with respect to making people, their assets, wildlife and habitat safer.

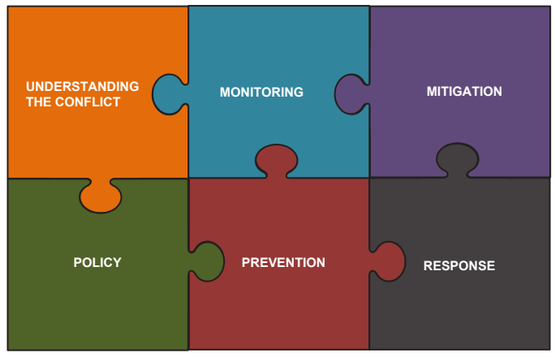
The three day Dzongkhag level workshops were followed by one-day consultation meetings with the farmers of the selected Chiwog in each selected Gewog. At each Chiwog, the discussions were on topics such as the overall HWC situation their locality, changes in the seriousness of HWC issue overs the years, perceived or observed causes of the change, main problematic wild animals, scale of the damage caused both in crops and in domestic animals, traditional measures in practices/use and future plans and recommendations for containing the issue. In addition, the strategies and interventions developed during the Rapid Assessments at the Dzongkhag level were also presented to the farmers for further refinement with suggestions from the grassroots level.

3 FRAMING THE CONFLICT

The complexity of HWC warrants evidence-based, and integrated solutions over the long term. HWC is dynamic in space and time, and is driven by a complex combination of social (including gender, religion, media, finance, etc.), ecological, emotional, climatic, political, and economic forces. Despite the fact that these forces change and are spatially distinct, the basic fact is that we know what these forces are (Brooks 2014).

Managing HWC globally takes on many forms. These include the development of community-based insurance/relief[1] schemes, fencing, trenches, deterrents (e.g. noise, lighting), and legal protocols for dealing with straying wildlife, active management of wildlife, community education, hotspot mapping, the use of rapid Response Teams following conflict events and monitoring of results.

These actions can be grouped into six conflict management elements: **policy, prevention, mitigation, understanding the conflict, response, and monitoring**. An integrated management approach to HWC means that all six elements must be accounted for in any site / area based program, and none should be implemented in isolation. Actions and lessons from each element must inform and reinforce actions in the other elements, and the effectiveness of the approach is contingent on *all elements* being implemented concurrently. Actions within some elements will require tested and transferable methodologies (e.g. in hotspot mapping and attack risk modeling), while other areas will require detailed protocols and decision-trees to be developed from scratch (Brooks 2014).



POLICY
Protocols, principles, provisions, measures undertaken by authorities, stipulated in legislation and governmental plans

- International law
- National law
- Wildlife and forest crime
- National strategy
- Translocation and response
- Insurance and compensation
- International collaboration

PREVENTION
Stopping or preventing HWC before it occurs

- Education and community awareness
- Livestock management and improved breeds
- Improved cropping
- Zero poaching
- Barriers (e-fence, bio-fence, trenches, bee fencing etc.)
- Deterrents (dummy tigers, lighting systems, sirens, burning dried chilies, scare crows, guard dogs etc.)
- Early warning systems
- Watch towers
- Habitat management, salt licks
- Waste removal
- Land use planning

MITIGATION
Reducing the impacts of HWC after it occurs

- Compensation programs
- Insurance schemes for crops and livestock
- Alternative livelihoods

RESPONSE
Measures taken to alleviate a specific or ongoing HWC incident

- Response teams
- Removal of problem animals

UNDERSTANDING THE CONFLICT
Research into all aspects of the conflict profile

- Hotspot mapping
- Spatial and temporal characteristics
- Social characteristics
- Severity and impact
- Capturing conflict information

RESULTS MONITORING
Measuring the performance and effectiveness of HWC management interventions over time

- Monitoring success
- Feedback

Source: (Brooks 2015) plus the NPPC training day

[1] *A relief scheme is often set up as an interim measure by non-government entities to ensure rapid, almost immediate, disbursement of compensation to affected individuals due to the long delays in processing government claims in some countries.*

3.1 Policy - protocols, principles, provisions and measures undertaken by authorities

Bhutan is advanced among regional countries in that it is one of only few with national wildlife conflict strategies. Various countries have no wildlife conflict-related policy due to no resources, no known conflict, or no official recognition of conflict. Where conflict-related policies do exist, there are various gaps in six key areas:

1. The lack of specific policies, guides, mandates and protocols to define and address problem animals. Where present, such procedures are ambiguous;
2. The lack of budgetary support to back up policy provisions and directions. A HWC strategy can be in place but has no financial provision for Response Teams, or it lacks financial foundation for compensation, relief schemes or to support expansion of local preventative measures;
3. The lack of integration with other sector policies and into national planning processes. HWC is not mainstreamed across the breadth of policies relating to habitat nor the spatial areas where humans and wildlife come into contact (development and spatial planning, law enforcement and forest/wildlife crime, land and resource use, protected area management, buffer zone delineation, disaster response, farming strategies, community development, recreation, religious pilgrimage, micro-finance and business, and education curricula), or on regulations to incentivize private sector engagement in HWC management;
4. The lack of monitoring and feedback loops to be able to determine performance and local applicability of HWC policies and enhance delivery over time;
5. The lack of community / stakeholder engagement throughout policy development. This is suggested to have precluded robust situation analysis and resulted in policies that do not reflect local contexts; and
6. Weak or no mechanisms for trans-boundary and international collaboration for HWC (Brooks 2015).

The lack of national policy and legal frameworks dealing with HWC mean that any integrated response would lack a national mandate, coordinated action, be precluded from potential funding and budgetary support, and lack the legal structures required for national insurance schemes. Local responses to HWC would also remain ad hoc in many instances, with discrete local initiatives unable to manage and respond to decreasing public tolerance for wildlife due to conflict, or able to prevent retaliatory killings (Brooks 2014).

3.2 Prevention - stopping or preventing HWC before it occurs

Prevention is the core tenet of effective conflict management. Deterrents and barriers such as repellents and fencing are among a large list of common solutions used in the field. The most appropriate will depend on the environmental and conflict context at the site (Nugraha *et al*. 2009, Barlow *et al*. 2010, Dickman 2010, Goodrich *et al*. 2011, Karanth *et al*. 2012, Saha 2013).

Some of the most common examples of barriers and deterrents are listed in Table 1. These physical/hard responses do not work in isolation and a range of other preventative measures are often employed: community education; improved livestock management; zero poaching; safe working environments and open spaces; protecting habitat; and land use planning. Lessons from the field highlight the need for the enhancement of such preventative measures overall and how to better learn between sites and upscale successful actions. Four themes are essential in this regard:

1. **Understanding the local context.** Preventative measures that do not reflect local realities have minimal impact. Modelling of land use change to predict conflict scenarios 21, and the use of conflict hotspot maps could be used to inform which preventative measures are most appropriate and where to locate them. Social studies should also be used to identify who are the most vulnerable people are in communities, and develop targeted education and awareness campaigns for them (WWF-TAI *et al* 2014);
2. **Monitoring performance** of preventative measures is a key weakness across large landscapes. The lack of monitoring means that knowing which measures work and which to upscale is typically done through experimentation (WWF-TAI *et al* 2014);
3. **Sharing lessons and scaling up**. Sites have minimal ability to learn successes and approaches from other areas. Easily accessible information systems and online portals could be developed to share success and information in a structured way (WWF-TAI *et al* 2014); and
4. **Collaboration beyond the site**. A vital component of effective preventative measures is the need to build partnerships beyond the sites themselves to develop best practice monitoring, increase the reach of success, and gain the participation of governments and NGOs in longer term efforts (WWF-TAI *et al* 2014).

In places where these learning and adaptation mechanisms were in place, the key deficiencies were the lack of resources and funding. A lack of funds and technical human resources meant that basic education and awareness raising could not be undertaken locally, the motivation of communities and government could not be sustained, and successful local innovations could not be scaled up (Brooks 2015).

3.3 Mitigation - reducing the impacts of HWC after it occurs

Mitigation mechanisms, including compensation, interim relief schemes (IRS), insurance, revenue sharing incentives, conservation payments, alternative livelihoods programs, payments to encourage co-existence (PECs), and management of problem animals are variously employed globally to buffer of mitigate the impact of an HWC event. For species conservation the ultimate purpose is to increase or maintain tolerance of wildlife in that area by local people, and thereby reduce retaliatory killing.

- **Compensation programs** are widely adopted across the region and typically provide a predetermined amount of funding to cover crop losses and damage, livestock loss, structural damage (to buildings), and the loss of human life and medical expenses where someone is injured. Compensation programs are however fraught with well documented challenges (Table 1) and failure of such programs runs the risk of raising expectations or losing community support if claims are poorly dealt with. If success is determined by the reduction of retaliatory killings and increased tolerance to wildlife locally, then the key to compensation program success is that compensation must be linked to conservation and conditional on behaviour change. The changes of behaviour that people commit to will contribute to both conservation and the minimization of future HWC.

Table 1: *Challenges to the implementation of compensation programs.*

PAY-OUT COSTS	Compensation is low, and losses are high relative to annual household income (Karanth *et al*. 2013). For example, permissible compensation for a cow or buffalo is less than the current actual market value of the animal (Bose *et al*. 2011).
	Unsustainably high payout costs, particularly where high rates of crop or livestock depredation occur (Goodrich 2010).
	Compensation rarely able to account for hidden and indirect costs of HWC (i.e. official papers or land-holding rights, costs of repeated travel to report losses or inquire about payments. For many this travel is at the cost of sacrificing paid work (Barua *et al*. 2013).
VERIFICATION	Difficulty in verifying claims (Goodrich 2010). Processes often require households to file official documentation supported by evidence (e.g. photographs of damage). Field verifications are conducted by officials to assess damage (Karanth *et al*. 2012).
	High numbers of false claims (Goodrich 2010).
	Government corruption (Goodrich 2010).
	Protected areas and buffer zones not clearly demarcated (Karanth *et al*. 2012).
COMPENSATION BIAS	Smaller animals such as goats and pigs may take multiple days to search for following an incident. Where there are time limits to seek compensation, such households may be precluded from compensation. Schemes may therefore be skewed towards larger events, or higher value crops or livestock that people can easily find the perpetrator following the event (Miller 2012).
TURNAROUND TIME	Bureaucratic inadequacies result in delays (Barua *et al*. 2013). It is such delays that often lead to retaliatory killing in anger (Bose *et al*. 2011).
	Rural banking services are poor and hence difficult to make timely payments (Goodrich 2010, Saha 2013).
	Typically compensation is provided immediately for human deaths and injuries but in other cases can take over a year to reach affected people for other events (Karanth *et al*. 2012). A recent study in India pointed out that on an average it takes about 16-18 months to receive compensation in some areas (Bose *et al*. 2011).
UNFORESEEN EFFECTS	May lead to a neglect of preventive measures or make people dependent on payments (Barua *et al*. 2013).

- **Insurance schemes** operate in much the same way as compensation with the key difference being that local people opt-in through a co-payment or contribution. The contribution then allows them to access funds when an HWC event occurs. Insurance schemes suffer many of the same pitfalls as compensation programs. Insurance should also be linked to the conservation outcome and be supported by capacity building and incentives for farmers to improve livestock management techniques to reduce loss.
- **Alternative livelihoods**: People and households that dependent on a single livelihood stream tend to be particularly antagonistic toward wildlife as the losses they incur are intensified by a lack of alternative assets or income strategies (Distefano *et al* 2006). Support to alternative livelihoods therefore has the benefit of not only diversifying income and reducing household vulnerability to shocks, but also alleviates some pressure on natural resources under competition, and can ultimately contribute to an increase in tolerance for wildlife in the area (Dickman *et al* 2010). Even in places where HWC is seen to be high from an outsider's perspective, most local risks and challenges relate more to livelihoods, incomes, health, access to opportunities, and natural disasters. Thus reinforcing the need to address such livelihood issues as part of any HWC management program.

Typical conditions for success of the various mitigation schemes include: low requirement for significant external funds; rapid and timely payments; payments and incentives linked to conservation outcomes and conditions; and that any payment could be a contributing factor to poverty alleviation (WWF-TAI *et al* 2014).

A key challenge locally is that compensation and insurance schemes are sometimes perceived as 'aid' by local communities. Such programs need to raise awareness of the scheme so it is not perceived that way, but in a way that communities ***are partners in conservation*** – not mere beneficiaries of aid. Effective designs are those that go beyond simple 'payments' to those that incorporate local preferences and needs linked back to a conservation outcome (Brooks 2015).

3.4 Response - measures taken to alleviate a specific or ongoing HWC incident

Response Teams serve a range of functions in attempting to reduce loss of both human and wildlife lives, as well as to reduce the threats (perceived or real) that wildlife pose. There is universal consensus for the need for Response Teams, and that they must be rapid. The specific nature of the Response Teams – their source of funding, where they should be located, and what types of Response Teams are required – is, however, more dependent on the local context. Response Teams are ideally located proximate to HWC hotspots. In many countries, the mode of funding is also different with some Response Teams being government funded, NGO funded, voluntary or a combination of each. Nevertheless, Response Teams require equipment, training, some form of base / infrastructure, and a local / national mandate in order to fulfill their roles. Importantly, Response Teams are considered to be of vital importance for enhancing the five other elements of HWC (WWF-TAI *et al* 2014).

Table 2: *Roles and functions of Response Teams.*

FIRST AID	As the first on the scene following an incident, Response Teams could save some human lives by administering emergency first aid, as well as raising the alarm for others to stay away from the danger (Barlow *et al*. 2010).
INVESTIGATE & VERIFY	Through their response to incidents, the teams systematically investigate and report on each site and conflict event. This helps to ensure accurate documentation and reduce false reporting, and can add veracity to any compensation/insurance claims that may arise (Nyhus *et al*. 2004, Dickman 2010).
REMOVAL	Response Teams have removed a number of problem animals (typically predators and repeat offenders). These have included wounded and diseased animals that did not cause conflict, but that wandered into towns, approached habitations, and even entered buildings (Goodrich 2010). Such situations represent a potential danger to people, domestic animals, and crops, and require intervention by trained personnel. Without Response Teams, many problem or straying animals would likely have been poached (Goodrich 2010).
CROWD MANAGEMENT	Response Teams serve to manage crowds and also actively participate in village trainings and meetings around HWC (Uddin *et al*. 2013).
ANTI-POACHING	In some countries Response Teams also have a law enforcement mandate which likely prevented HWC-related poaching of species such as tiger, elephant and rhino (Goodrich *et al*. 2011).
ALLAYING FEAR	The ability of the Response Teams to reduce the perceived risk may be its most important contribution to minimizing endangered wildlife mortality following HWC (Miquelle *et al*. 2005). By responding quickly to an incident the team provides an official acknowledgement of the public concern and helps to alleviate the antagonism locals might have toward the animal, and also maintain tolerance for wildlife overall (Miquelle *et al*. 2005).
PROVIDING ADVICE	Response Teams are an ideal body to provide pertinent advice to land owners, farmers and local communities in the most effective strategies to prevention future HWC events (Parakkasi 2013).
MONITORING & REPORTING	Response Teams play an important role in monitoring, not only of incidents overall but of animals themselves. If animals are hazed out of an area, the Response Teams may monitor their movements (using radio collaring, or local informant networks) to track if they return or become a problem. Furthermore, the data recorded from each incident can be collated and periodically evaluated to guide adaptive management and the enhancement of prevention and mitigation strategies (Goodrich *et al*. 2011).
OTHER BENEFITS	Response Teams are typically local people, and therefore bring very experienced and nuanced knowledge to HWC and problem animals (Gurung *et al*. 2008).

Response Teams also need to be recognized and embedded within national government policies, strategies and budgets, and where Response Teams exist there should be provision to allow for local volunteers to integrate into them (WWF-TAI *et al* 2014). The formation of policies that include Response Teams should however, not come at the expense of decentralized decision-making in response to HWC events i.e. local Response Teams and officials need to have the power to make rapid decisions that are backed by national policy. Various challenges from the field that constrain Response Teams are:

- Gaining and maintaining commitment from volunteers, and also from Response Teams in low conflict contexts;
- Lack of trust by locals in Response Teams;
- Lack of transparency in reporting processes;
- Lack of decentralized decision trees and effectiveness of protocols;
- Lack of government policy for Response Teams. This is linked to a lack of political will, lack of resources, and ultimately, a lack of sustainability. In places where it was deemed necessary to have Response Teams, but they were non-existent, this lack of funds was suggested as the cause;
- Lack of reporting and free hotlines;
- Low training levels; and
- Slow response times.

3.5 Understanding the Conflict - research into all aspects of the conflict profile

Understanding the Conflict is all the ongoing research that goes into understanding of the drivers and severity of conflict, and the spatial, temporal, and social characteristics of HWC events. In most conflict landscapes, this knowledge is missing and managers and decision makers are therefore limited in their ability to manage conflict and minimize loss through prudent allocation of resources. Of vital importance to managers is: knowing where, when and how conflict events typically occur; the social characteristics of the victims; understanding how severe the impact of conflict is relative to other community challenges; and how better to capture and analyze the information gathered.

Spatial and temporal characteristics

Most conflict studies are characterized by poor spatial modeling (Karanth *et al*. 2012). The benefits of 'attack risk modeling' and 'hotspot mapping' are widespread:

- HWC management can be more efficient because resources can be directed to conflict hotspots. Preventative activities (e.g. where to do habitat restoration and weed management, and where to locate barriers and conduct education) can be targeted at villages and households located in conflict hotspots. Further research could then determine household characteristics and practices that relate to high conflict scenarios. Systems for rapid reporting as well as Response Teams can also be set up in known hotspots (Karanth *et al*. 2012).
- Spatial mapping of livestock and crop loss can inform managers on how best to support land use planning, improved grazing practices, building selective fencing around crops, and weed management in priority areas (Miller 2012).
- Understanding temporal characteristics may help understand seasonal variation in HWC and direct actions to protect crops during peak HWC periods, or address water supply management for livestock and prey (Barlow *et al*. 2010).
- Hotspot mapping can feed into local information systems to enhance prevention and mitigation programs.

Community attitudes

Understanding community tolerance and perceived risk are both important in the context of HWC management. In some areas humans and wildlife seemingly co-exist within a 'tolerance habitat' (Athreya *et al*. 2013), while in other places retaliatory killing of animals is dictated more by the perceived risk of local people than by the actual impact of the event. i.e the response is disproportionate to the initial incident (Inskip *et al*. 2013).

- **Tolerance**: Some landscapes exhibit very high levels of HWC, however there appears to be some degree of acceptance of conflict events (Karanth *et al*. 2012). This could suggest that communities have developed coping mechanisms, or that they exist within a tolerance habitat. The idea being that humans and predators can co-exist in multi-use landscapes – up to a point. Once this is breached, communities will more likely lose support for co-existence and take direct action to control the wildlife. A nuanced understanding of community attitudes around PAs and within multi-use corridors will help to guide the development of appropriate prevention, mitigation and response programs, with the goal of raising community tolerance as HWC decreases.
- **Risk**: Subjective perceptions of the risk posed by wildlife, particularly predators, motivate retaliatory killing (Inskip *et al*. 2013). This is based on the idea that response to an incident does not correlate with the amount of damage the animal did during the incident. The response is more about how people feel toward the animal at that time. An understanding of risk perceptions is therefore fundamental to the development of effective HWC management strategies (Inskip *et al*. 2013). One study in India found that risk and retaliation related to community issues around education, access to better health care, jobs, and improved housing. The proposed HWC management actions therefore centered on programs in support of these areas in order to address received risk (Inskip *et al*. 2013).

Severity and impact

Knowledge of the severity and impact of HWC informs better design of management responses. Severity is the frequency of events, coupled with the relative economic situation of the event vs other household or community challenges. Impact is the cost of an event or HWC overall. This could be: lives lost; costs invested in preventative or mitigative measures versus their benefit; opportunity, replacement, or change in productivity costs; costs associated with change in farming practices; or direct costs due to loss of assets (livestock, crops or buildings).

- **Severity and design**: In Bhutan a locally-based insurance scheme for livestock did not have wider appeal and may have failed because livestock did not make up a significant part of household income (Wangdi 2014). In the high conflict area of Corbett, India, livestock lost from HWC is small in number and severity compared to livestock lost to disease (Harihar 2014). Such knowledge of the relative severity of HWC must be accounted for in design of any local intervention.
- **Impact assessments** for HWC often do not go beyond quantification of area and type of crop lost, numbers of livestock lost etc. In some landscapes comprehensive impact assessment methodologies have been developed that look at costs of HWC interventions vs crops and livestock saved. This is then translated into overall impact (Barlow *et al*. 2010).

Capturing conflict information

The capture (regular and systematic reporting of events) and use of conflict information are critical for understanding the conflict, and form the centerpiece of effective HWC management systems. Without reporting and information that is then made available to managers to inform decisions – the whole system can fall apart.

- **Reporting**: The most common constraint to effective HWC management is that most incidents go unreported. This has significant cascading effects: unreported events means there is no Response Teams mobilized, raising the risk of a retaliatory killing (Nugraha *et al*. 2009). No response means no data is collected about the site, incident, severity, causality, timing, location etc., and a compensation or insurance claim may not be verified. For management purposes it precludes any ability of decision-makers to make informed choices of where to allocate resources. From a government budgeting perspective it would appear that in such areas no conflict is occurring and that minimal budget is required to support Response Teams or prevention and mitigation strategies in that area.
  - Evidence shows that many HWC victims do not report incidents for a range of reasons: inadequate awareness – i.e. that people did not know they could report; the reporting process is too lengthy / difficult and skepticism surrounds the veracity of the reporting and claim process; many reported HWC events do not receive the compensation payment they are entitled; and management interventions are invisible, thus reporting is irrelevant (WWF-TAI *et al* 2014).
  - Reporting is found to be higher in places where reporting was linked back to existing transparent and functioning incentive schemes (WWF-TAI *et al* 2014).
- **Information compilation, management and use**: Accessible data of HWC comes from a range of disparate sources. Research into HWC necessarily involves a combination of primary data, local interviews, government historic, project reports, and media analyses. All of which are patchy at best. This is symptomatic of there being a lack of centralized accessible databases on HWC in most countries across Asia.
  - A national or jurisdictional database on HWC would significantly benefit management responses and contribute to understanding HWC trends. The database could identify the location of incidents, relevant dates, habitat type, crop type, cattle breed, the perpetrator (species, age, sex, and details about what happened after these attacks (e.g. response, animal removal, killed, captured, or trans-located). This information would also provide the foundation for hotspot mapping to identify potential high risk areas, where to locate Response Teams, and how to tailor prevention and mitigation strategies. It would also be a key component of community information systems on conflict.

3.6 Monitoring and Evaluation - measuring the performance of HWC management

Monitoring the performance of HWC management is a weakness across all conflict landscapes in Asia. In most areas a HWC monitoring and evaluation framework is lacking altogether. Various challenges to effective monitoring currently exist in the field:

- Difficulty in obtaining robust information due to the often hidden nature of conflict;
- The lack of data to establish baselines or understand HWC context;
- The lack of management focus and funds for ongoing conflict monitoring;
- The time required to sufficiently collect data, analyze and report findings;
- The lack of local participation in monitoring; and
- The lack of an overall guiding framework and tools for monitoring conflict management programs.

4 CURRENT CONTEXT: HWC IN BHUTAN

4.1 Size and nature of the challenge nationally

It is difficult to accurately quantify the full extent of human and economic loss of HWC in Bhutan due to crop loss, livestock depredation and attacks on people. This is largely due to the lack of a single national reporting system and database. Available data are either not on an annual basis or not accurately collected. Nevertheless, the available information from 2011 – 2015 indicate that during the period, almost 500 domestic animals have been killed with tiger killing 382 and leopard 60 and human casualties amount to around 25 cases (http://www.kuenselonline.com/review-human-wildlife-conflict-strategy-say-foresters/). The highest human loss was caused by the Himalayan Black Bear with 17 lives while wild boar killed 4 people. The rest were lost to elephants and common leopard.

Crop losses are far greater in scope and magnitude. During 2011 – 2015, data submitted to the Department of Agriculture by the 9 Dzongkhags indicate that about 420 metric tons of crops were lost to wild boar, elephant, deer and monkey. The highest was lost to wild boar; about 315 metric tons. However, the figure does not reflect the data from all the Gewogs within the Dzongkhags.

While it is difficult to quantify due to lack of data, the loss of a single cow – the sole source of household income in rural areas – can have a devastating impact on a family. This is also true with the crop loss where average land holding in Bhutan is around 0.84ha (BLSS 2013) and income diversification is very low. Regardless of the context of each HWC event – the results ultimately end in a negative result for wildlife. They are either killed in retaliation by communities or authorities, removed by managers to be put into managed facilities, and the tolerance of local communities for their presence decreases. It is thought that the population boom of feral pigs in Bhutan is attributed to the gradual retaliatory killing of wild dogs through carcass poisoning for attacking cattle. This can also be due to growing attractive crops such as potatoes or maize or discouragement of slash and burn agriculture, leading to the springing up of more unmanaged woodland in the vicinity of farmlands.

The solution should be simple: keep wildlife and people apart, local tolerance can then be maintained, and co-existence can be achieved. Human population growth, the changing face of rural areas and wildlife landscapes are however making that prospect increasingly challenging. As human populations grow rapidly, so too does the area needed for agriculture and transport. These invariably expand into previously remote forested areas – wildlife habitat. New settlements emerge right next to forests following land clearing which only a decade ago were forests far from human interference – the buffers that kept wildlife and humans separate are disappearing. This competition for space and habitat is a key driver of HWC and humans are not only ones on the move. The success of conservation also increases the incidence of HWC.

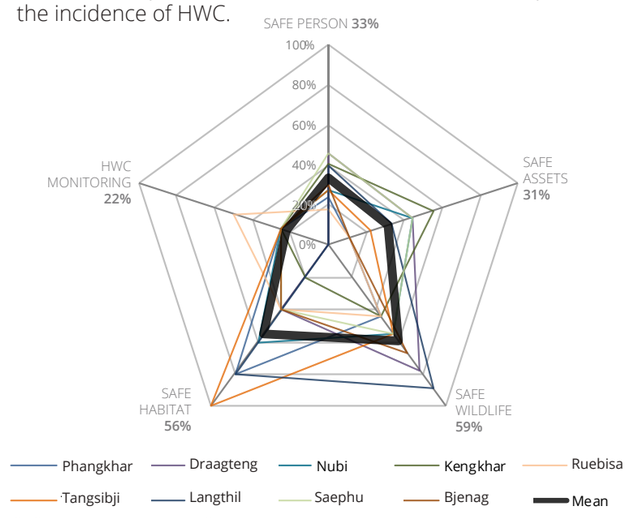


Figure 2: *SAFE Baseline for each Gewog reflected against the mean.*

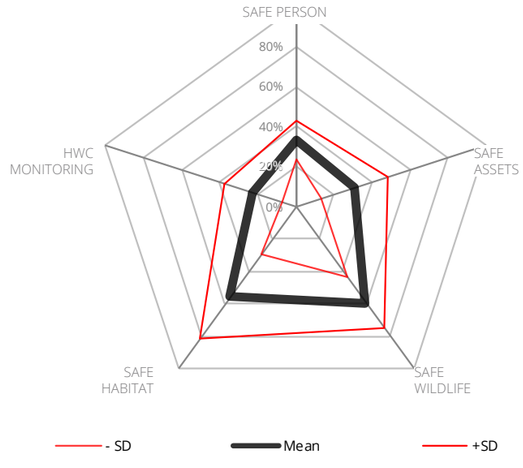


Figure 3: *Mean SAFE Baseline across all Gewogs with standard deviation.*

Table 3: *SAFE baseline figures for each Gewogs across the outcomes with mean and standard deviation*

OUTCOME	Ruebisa	Bjenag	Saephu	Tangsibji	Nubi	Draagteng	Langthil	Kengkhar	Phangkhar	Mean	Stan. dev
Safe Person	18%	30%	45%	27%	27%	45%	39%	41%	24%	33%	10%
Safe Assets	11%	11%	44%	22%	44%	44%	33%	56%	11%	31%	17%
Safe Wildlife	44%	67%	56%	56%	56%	78%	89%	44%	44%	59%	16%
Safe Habitat	40%	40%	40%	100%	60%	40%	80%	20%	80%	56%	26%
HWC Monitoring	50%	25%	25%	25%	25%	0%	0%	25%	25%	22%	15%

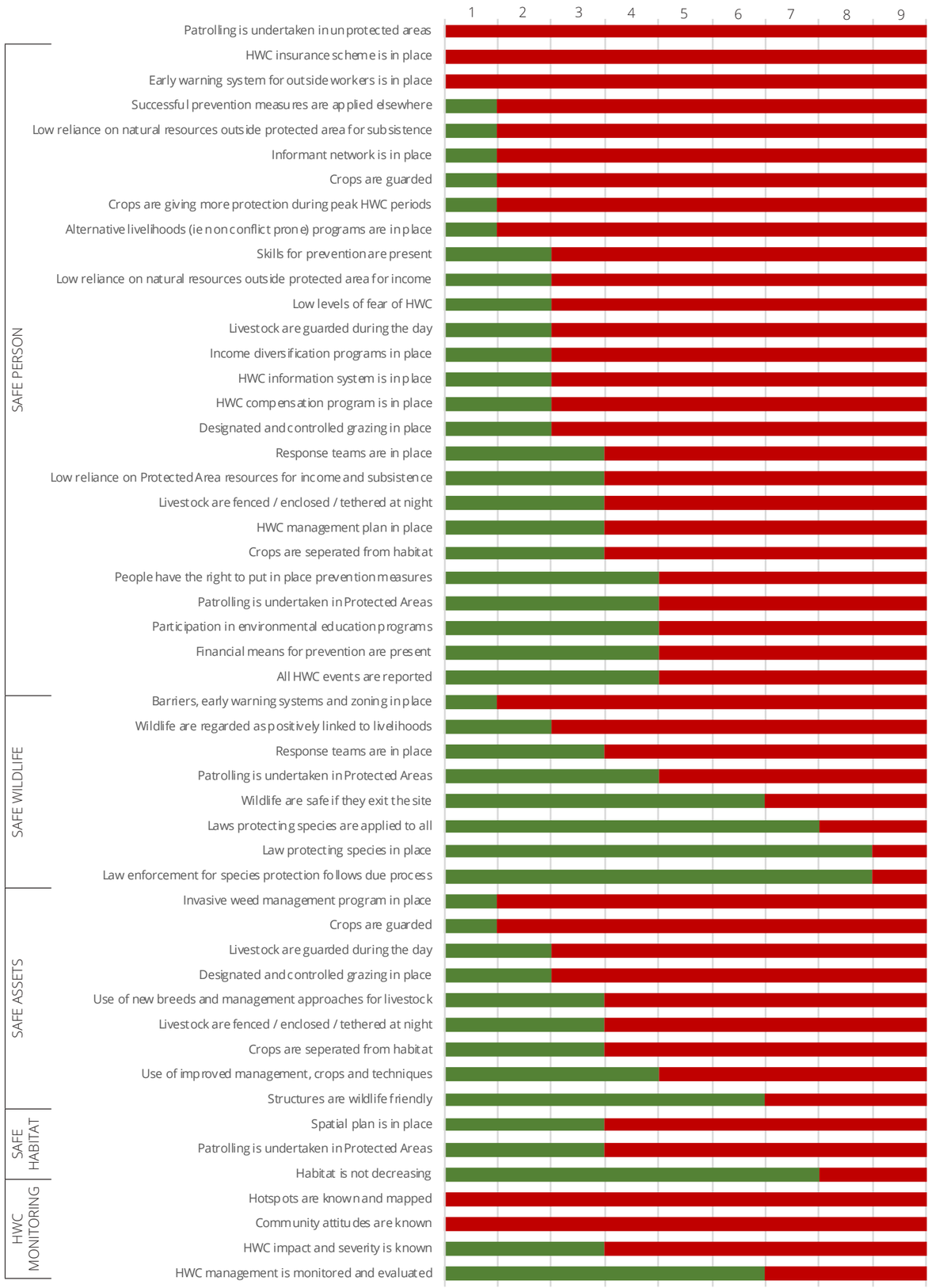


Figure 4: *Frequency of number of times criteria are met (green) or not met (red) under all SAFE Outcomes across all nine target Gewogs.*

4.2 Results

The overall SAFE Baseline results for the nine Gewogs illustrate to a large degree what was expected for Bhutan: that habitats and wildlife are generally the most safe (owing to strong cultural beliefs and policy), while people and their assets are far less safe, as reflected in national recognition that HWC is major issue. Monitoring is also weak across the board and this is reflected in the patchwork of HWC data available across the Dzongkhags and nationally. It is these SAFE Baselines that the HWC Strategy can work to improve over time.

The HWC Rapid Assessment results are able to give us a deeper understanding of where the current strengths and weaknesses are in terms of HWC Management across the nine Gewogs. Figure 4 shows the criteria most often met across each of the SAFE Outcomes (green). These are reached through existing government programs across the sites. It is across these criteria that the Strategy would recommend a continuation of the current actions by government in those Gewogs. Conversely, Figure 4 also highlights the weakest areas (red) that currently contribute to the low SAFE Baselines for People, Assets and Monitoring. Enhanced activities across these areas in terms of effectiveness and scope will lead to improved HWC management and a reduction in conflict overall through making the area safer.

Figure 4 illustrates that there are various criteria that are not being met across the nine target Gewogs, which is contributing to the low SAFE Baseline for people. This is especially the case where the minimum criteria for Safe Assets and HWC Monitoring are often not met in many Gewogs. Figure 4 clearly highlights the areas in which improved effectiveness and scale of HWC management work needs to be undertaken, and they also help to explain why various parts of the system are reaching only modest SAFE Baseline scores. The mean Safe Baselines and standard deviations (Table 4) also highlight the similarity of contexts across the nine Gewogs. There is no significant spread away from the mean across the Gewogs. Only Safe Habitat shows a greater spread away from the mean which may be due to the variation in sizes of Gewogs, size of natural forest habitat present, and perceived changes in natural habitat over time in each. In future Rapid Assessments and through monitoring, the reasons for this divergence from the mean can be elicited.

The HWC Rapid assessment results also give us a very good indication of the 'spread' or integrated nature of the HWC management currently in place across the nine Gewogs. We are able to elicit this through analysis of the current actions against the six elements of conflict (Refer Section 3 above). Keeping in mind that effective HWC management

Figure 5: *SAFE baseline figures for each Gewog per Conflict Element.*

Table 4: *SAFE baseline figures for each Gewogs across the elements with mean and standard deviation.*

CONFLICT ELEMENT	Ruebisa	Bjenag	Saephu	Tangsibji	Nubi	Draagteng	Langthil	Kengkhar	Phangkhar	Mean	Stan. Dev.
Policy	75%	88%	100%	88%	88%	88%	100%	88%	88%	89%	8%
Results Monitoring	100%	100%	100%	100%	0%	100%	0%	100%	100%	78%	44%
Prevention	26%	26%	37%	29%	32%	49%	42%	36%	32%	34%	7%
Response	25%	0%	0%	0%	50%	0%	50%	25%	25%	19%	21%
Mitigation	0%	0%	0%	40%	0%	0%	40%	0%	0%	9%	18%
Understanding the Conflict	0%	0%	0%	25%	25%	0%	0%	0%	0%	6%	11%

programs that minimize conflict over time have an even spread of interventions across all the six elements, we can see from the average results across the nine Gewogs that there are significant gaps. The long term aspiration here should be that each of the six elements are reaching as high as possible toward 100%.

The strong policy foundation in Bhutan is reflected in the results, and the various data collection done across some Gewogs is also reflected by the high score for Results Monitoring. The low results for Prevention are reflected in the statistics on crop loss and livestock depredation, whereby less effective preventative measures are allowing for assets to be raided. Similarly low scores for Mitigation and Understanding the Conflict highlight the lack of comprehensive participation in insurance and compensation schemes locally, plus the lack of research into hotspots and community attitudes overall is reflected by only 6% score for Understanding the Conflict (UtC). Activities in this Strategy will need to ensure that a more even spread of mutually reinforcing actions across the six elements is implemented. The results will also act as a baseline for the Strategy to build on over time. Table 4 also highlights the similarity between the nine Gewogs with regard to the six Conflict Elements. Gewogs are most closely aligned when it comes to Policy and Prevention elements, and diverge most significantly under Results Monitoring.

Bjenag Gewog, Wangduephodrang Dzongkhag

The total area of Bjenag is 12,106 ha with 848 ha under agricultural cultivation and 9,943 ha forested with a population living in 225 households (PPD 2015). In winter farmers migrate to Khotokha where they cultivate potatoes, while in summer they migrate to Bjenag and cultivate paddy. Crop production and livestock are important economic activities pursued by the farmers with paddy and wheat are the two primary crops. In 2012, area under paddy cultivation was 86 ha with 298 metric tons produced. Wheat was cultivated across 15 ha and total production was 47 metric tons (PPD 2013).

Livestock statistics show that in 2015 the Gewog had 2,487 head of cattle and 66 horses (DoL 2015). Cattle are used for milk and draught purposes while horses are used for transportation materials in areas where there is no road accessibility.
HWC is a serious issue in the Gewog. According to the farmers during the Rapid Assessment, in 2013, the Gewog lost around 1.3 ha paddy and potato fields to wild boars, with a total production loss of 8,350 metric tons. This has affected

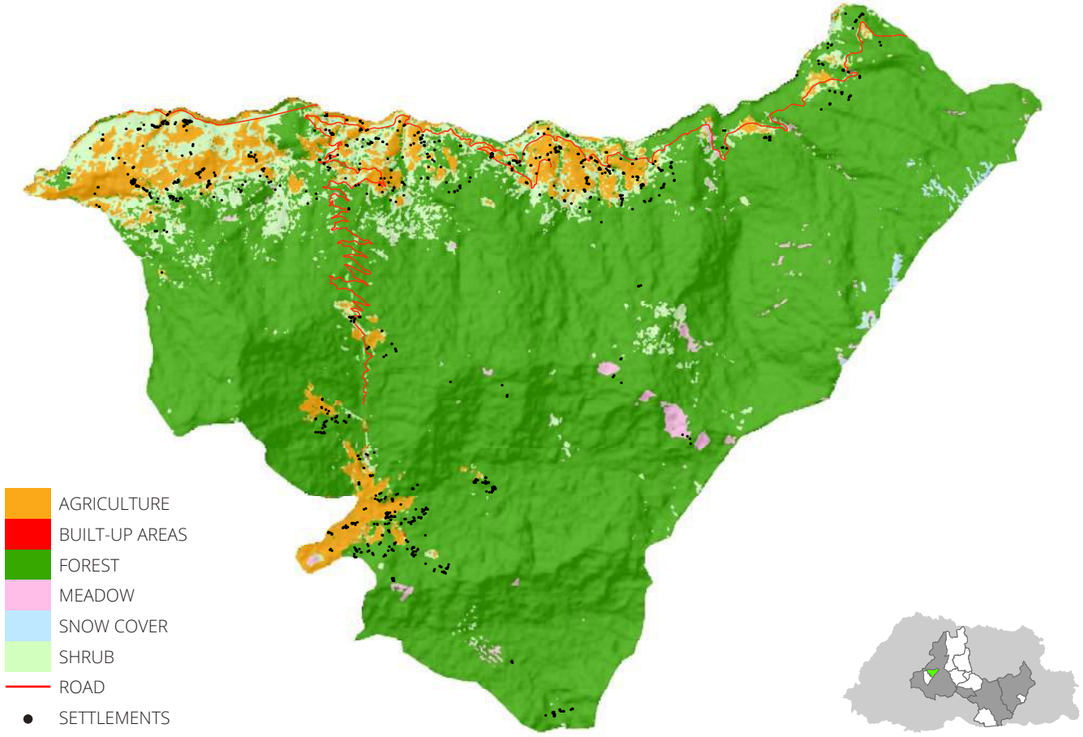


Figure 6: *Bjenag Gewog land cover (MoAF 2010).*

10 households to lose their food security for the year. What they produce is enough just to feed the family for seven to eight months. Around 14 ha of land was left fallow. Of the total land farmers own, one part is left fallow due to the wild animals attack.

Cultivation of summer crop paddy and winter crop wheat was a common practice of farmers in the Gewog. But now farmers do not cultivate wheat in the winter. Even if they do they cultivate nearby settlements for easy guarding. HWC has caused the farmers to reduce cultivation of wheat. Sweet and bitter buckwheat are no longer cultivated due to the conflict. These crops were, in the past, used as a feed for livestock but are now replaced by the Karma feed.

It is difficult for farmers to cope with wildlife damage, especially crops like potatoes. The moment potatoes are planted, they are attacked by wild pigs. Then farmers have to replant and again wild pigs damage them. This keeps on repeating and by then the potato planting season has already passed and replanting becomes impossible. In areas where wild boars have rampaged, their footprints collect rain and rot potatoes.

Farmers in Bjenag feel the HWC has increased. People even feel that wild boar reproduce twice in year and add to population so rapidly. One farmer saw wild boar with 9 piglets, then a few months later, he saw the same wild boar with a new set of nine piglets. The increased in HWC is attributed to Forest and Nature Conservations Rules of 1996, which prevented people from hunting, slash and burn agriculture. Farmers also attribute to spread of Buddhism for increasing the HWC.

The worst scenario is when farmers have nothing to repay the loans that they have borrowed to purchase pesticides and fertilizers. Farmers typically borrow Nu. 25, 000 – 30, 000 on average. They mortgage land for the loan. When crops are destroyed by wildlife, there is nothing they can repay through the sale. They ask their relatives to help them by borrowing but that is also difficult.

Leopards are common predatory animals in the Gewog. They are even capable of taking away the cattle from the sheds. Generally, horses are mostly attacked because they are left unguarded at night. At least cattle are protected as they are put inside sheds. A compensation program does exist in the Gewog, but it has low participation rates.

The Rapid Assessment results for Bjenag reflect this HWC context. People and their Assets are very weak parts of the system, and only meeting 21% and 11% of criteria overall.

The Strategy will need to support HWC actions in these two areas as a priority to begin to reduce the crop raiding through prevention and also to support buffering of household incomes from HWC shocks.

Figure 8 also highlights the dearth of an integrated approach to HWC management within the Gewog. The Strategy will support a comprehensive suite of activities in order to increase the number of criteria being met across all elements of conflict.

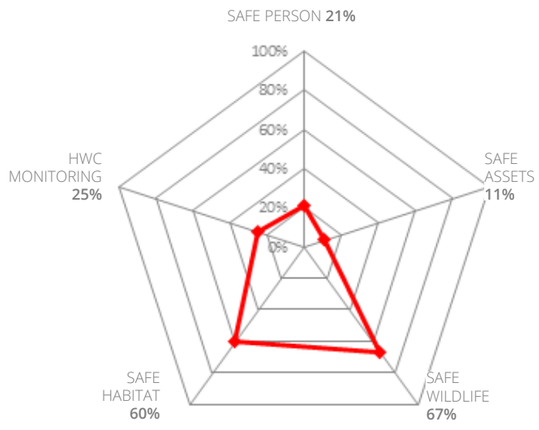


Figure 7: *SAFE Baseline for Bjenag.*

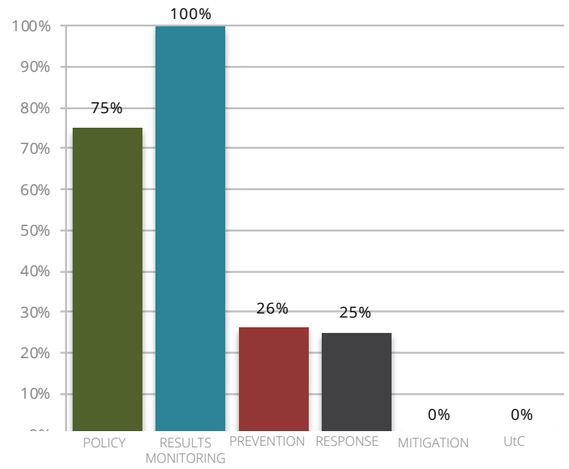


Figure 8: *Conflict Element baseline for Bjenag.*

Ruebisa Gewog, Wangduephodrang Dzongkhag

The total households residing on the farm in 2011 was 292 across 296 households. The total area is 16,084 ha of which 637 ha is agriculture and 13,127 ha forested. Wheat and maize are the two primary crops grown in the Gewog, with wheat yield in 2012 being 59 metric tons MT (PPD 2013). Livestock are also a key contributor to the Gewog economy with 2,206 head of cattle (DoL 2015).

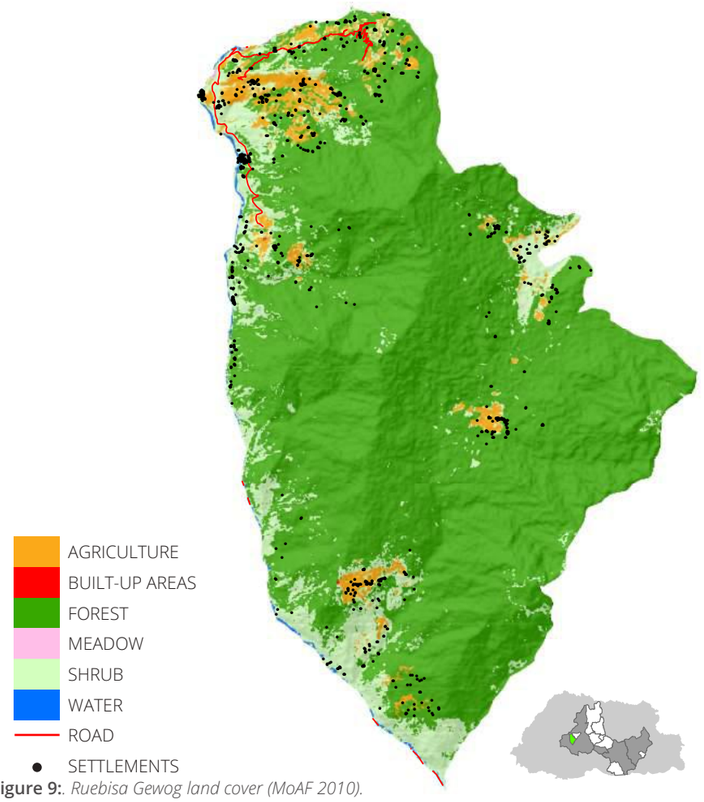


Figure 9:. *Ruebisa Gewog land cover (MoAF 2010).*

HWC is a threat to food security in the Gewog. Despite guarding their crops, farmers can still lose 30 – 40% to wildlife. In 2015, the wildlife affected 21 households and caused loss to 3.75 ha of land and 16 metric tons. Farmers feel food produced from their field is good to feed the family for a year if wildlife damage is not there. But due to wildlife damage, the food they produce is just enough for seven months. For the remaining months they buy from the market.

Farmers feel that there is no use working in their field because they invest so much hard work only to see crops damaged by wildlife. Some farmers now engage in construction activities, grow hazelnut, or have abandoned planting winter crops altogether. Farmers feel a wild pig disease also helped control the populations. There was one time the disease outbreaks and this has helped reduce the wild pig numbers. Farmers wish if there is such outbreaks this would help to control the pig populations. Farmers also feel the problem of wild pigs is biennial – one year there is a problem and another year the problem does not emerge.

The HWC Rapid Assessment results typified the same strengths and weaknesses from the other target Gewogs. The weakest parts of the system were People (24%) and their Assets (11%), with few criteria for HWC Monitoring being met (25%). SAFE Habitat (60%) and Wildlife were once again the strongest parts of the system across the Gewog. In terms of an integrated approach to HWC management, the Gewog showed high level of Results Monitoring through data collection, and also strong reflection of Policies, and consistent with the other target Gewogs, relatively low Prevention Criteria being met (26%), but with some Response mechanisms in place (25% of criteria being met).

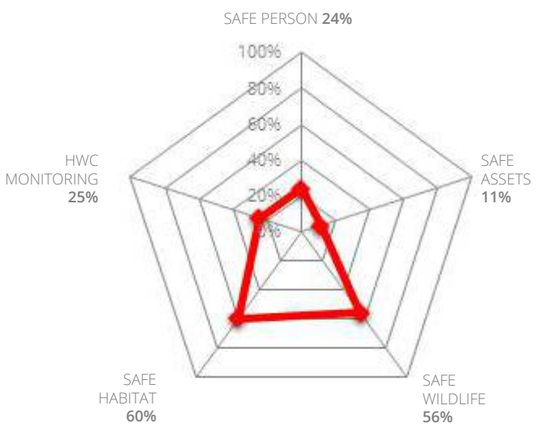


Figure 10:. *SAFE baseline for Ruebisa.*

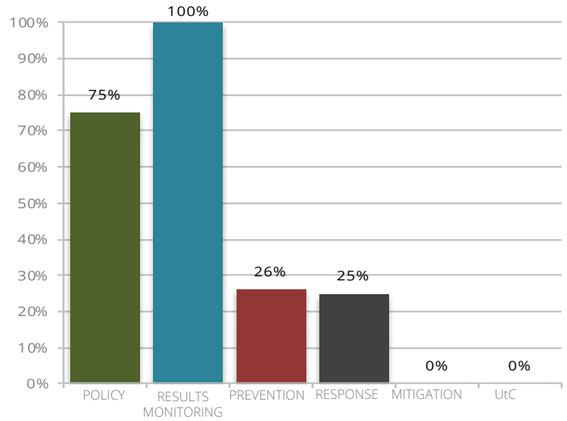


Figure 11: *Conflict Element baseline for Ruebisa.*

Saephu Gewog, Wangduephodrang Dzongkhag

Saephu is home to around 258 households across an area of 99, 144 Ha. Agricultural land totals 165 ha and the forest covers 29, 304 ha (PPD 2013). The main cereal crop grown is wheat while potatoes are cultivated for the domestic and market purposes. In 2015, the total area under wheat cultivation was 3.6 ha with production of about 6 metric tons. Potato was grown in area of 67 ha and produced 892 metric tons (PPD 2013). Livestock production is the main source of income and livelihood in the Gewog. There are 3,551 head of cattle and 40 horses. In addition, pigs, poultry and goats are reared (DoL 2015).

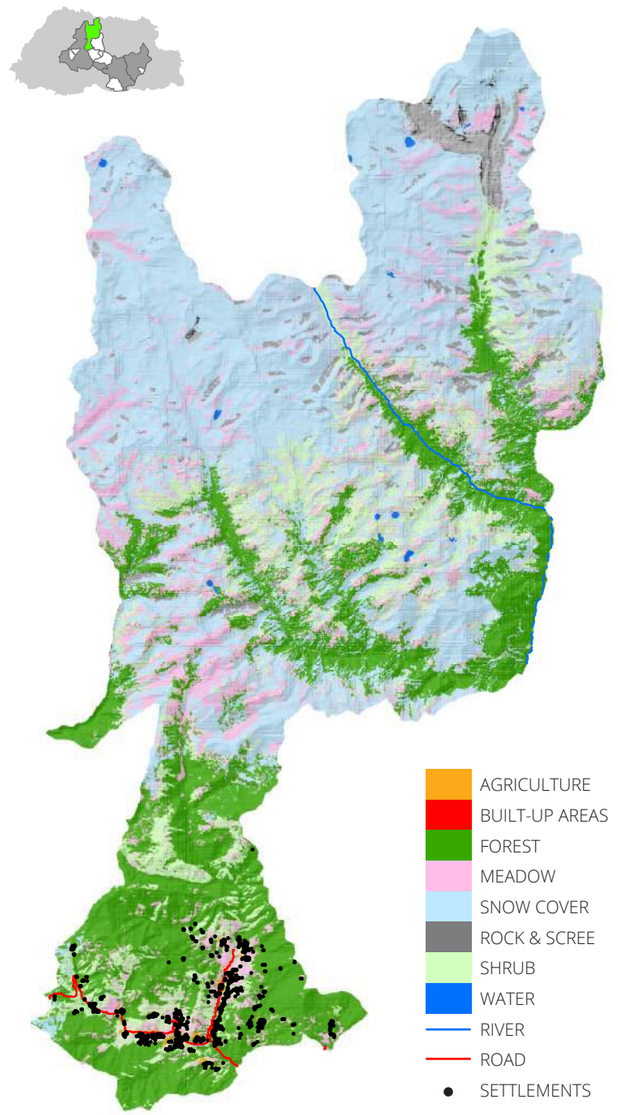


Figure 12: *Saephu land cover (MoAF 2010).*

HWC in the Gewog is a serious issue both for crops and livestock. Wild pig is the main problem animal followed by sambar deer and barking deer. The conflict is a threat to the food security of the Gewog. It is estimated that the Gewog loses around Nu. 50, 000 equivalent of potatoes to wild pigs annually. Even if farmers guard, there is damage of about 1.5 metric tons per household. As a result of conflict, land close to forests are left fallow; close to 1.2 ha. Farmers feel that continued HWC will lead to increasing fallowing in the Gewog. Farmers have negative perceptions toward wild pigs overall and have lost tolerance. They feel there are two groups of wild pigs; one living in groups and the others solitary. They feel solitary wild pigs are very dangerous and capable of attacking people. Farmers also feel wild pigs are not scared of people and do not heed to shouting.

Livestock predation by bear and leopard is very common in the Gewog. During the span of 1.5 years (2015 & 2016), farmers have lost 15 cattle (cow – 8; calves – 7). It has become so common for bears to steal cattle from the sheds now. Farmers feel they not only have to guard the crops now they have to even guard cattle put in the shed because of bear attacking at night and stealing the cattle. Tigers are also present in the Gewog but not very close to the settlement areas. Due to reverting of pasture land to government, there is no pasture in the Gewog and overtaken by tree growth. This has provided additional habitat to wildlife. Guarding is a big problem in the Gewog. Due to rural-urban migration of young people, only elderly people remain in the villages, and they are not fit to guard due to old age. People sometimes use highland dogs called "Bjobchi" to guard and leopards have not been able to attack them unlike small pets.

As an alternative to crop and livestock loss, farmers have Codyceps to depend on. But then collecting is very difficult, often requiring high personal risks. In the past, people also used to work on bamboo products.

The HWC Rapid Assessment results reflect the other target Gewogs, though People (33%) and Assets (33%) are marginally safer in Saephu than other Gewogs. Habitat and Wildlife were also measured to be less safe here compared to other Gewogs. The integration of activities is also weak, but reflects the same conditions / context of the other target Gewogs, where Policy and Results Monitoring are meeting most criteria, with some adherence to meeting criteria under preventative measures, and no criteria met under the remaining Conflict Elements.

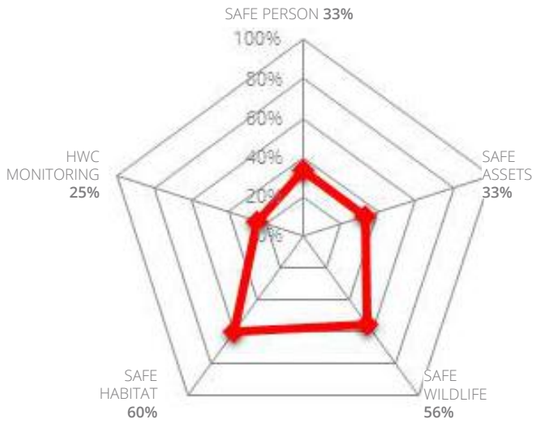


Figure 13: *SAFE baseline for Saephu.*

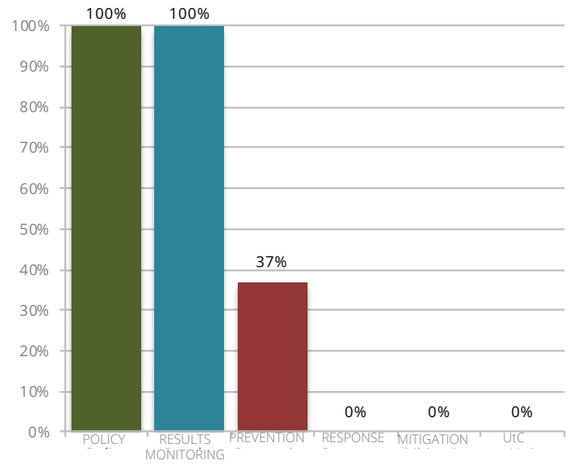


Figure 14: *Conflict Element baseline for Saephu.*

Draagteng Gewog, Trongsa Dzongkhag

As per the data submitted by the Gewog Agriculture Extension Officer, in 2015, Draagteng Gewog is home to 448 households across 32 villages. There are 3,612 people living in the Gewog. The total agricultural area is 554 ha while the forest covers about 6,163 ha.

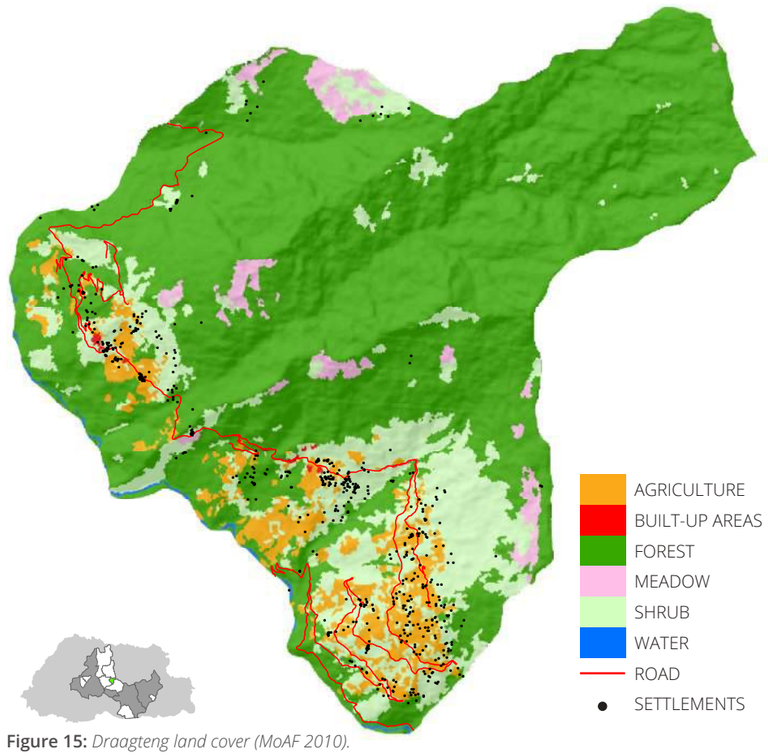


Figure 15: *Draagteng land cover (MoAF 2010).*

Paddy, maize, wheat and buckwheat are the main cereal crops grown in the Gewog. In 2012, 282 ha of land was under cereal (paddy, maize, wheat) cultivation with total production of 804 metric tons (PPD, 2013). Potato was grown in 32.9 ha of land with total production of 295 metric tons while chili was cultivated in 36.7 Ha with 32.9 metric tons produced (PPD 2013).

Share cropping is very common and historically practiced in the Gewog. More than 70% of the wetland is owned by people in the neighboring Dzongkhag of Bumthang. Rural-urban migration is not present in the Gewog but share cropping and HWC have been the main cause of people leaving land fallow. In 2015, based on the data submitted by the Gewog Agriculture Extension Officer, the total land left fallow was 414 ha while 23 Ha was leased in.

Livestock production is an important component of farming in the Gewog. Butter and cheese processed from the cattle are sold in the Dzongkhag and Thimphu. In 2015, there were 2,524 head of cattle and 48 horses. The Table below gives the livestock statistics in the Gewog (DoL 2015).

Crop loss to wildlife is a serious issue in the Gewog. It is one of the biggest constraints faced by farmers in crop production. It is considered a threat to their food security as more than 50-80% of the production is lost to wildlife,

especially to wild pigs. Since the share cropping in the Gewog is very common and historically present, the challenges resulting from crop loss is further aggravated by farmers having to share their yield with the land owner. Anecdotally, 50% of crop yield is lost to wildlife, while of the remainder 25% is given to the land owner and 25% left for the share cropper. The relative severity of crops lost to wild pigs is significant in the Gewog (Table 5). According to the Data submitted by Gewog Agriculture Extension Officer, wild pigs are by far the biggest challenge for food security and crop safety in the Gewog. Of the 233.1 metric tons of crops lost in 2014, 207.1 metric tons (or 89% of crops lost) was loss to wild pigs (Table 5).

Farmers use traditional methods to protect crops such as fences, scarecrows, rituals and guarding. However, traditional methods are considered only partially effective. In the past, people used to hunt wild animals and control wildlife populations and the conflict. But now the government's policy on conservation prohibits hunting. Religious sentiments have also made people stop hunting.

Table 5: *Metric tons of crops lost to wildlife in 2014.*

Chiwog	Wildlife	Paddy lost	Wheat lost	Maize lost	Barley lost	Buckwheat lost	Potato lost	Vegetables lost	Total MT lost
Kuengarabten-Changrey	Wild pigs	12	0.5	6	0.1	8.4		6	33.1
	All other wildlife	0.4						6	6.0
Yussa	Wild pigs	11.8	1	18	1.1	7	4	3	46.0
	All other wildlife							4.5	4.5
Taktse-Tashidingkha	Wild pigs	14.7	1.5	7.2	1.4	4.2	2	6	37.1
	All other wildlife							9	9.0
Samcholing Khatoe	Wild pigs	10.2	1.7	14.4	2.8	9.1		6	44.3
	All other wildlife							3	3.0
Samcholing Khamey	Wild pigs	15.3	2.8	18	0.5	7		3	46.7
	All other wildlife							3	3.0
TOTAL		64.6	7.5	63.6	6.0	35.7	6	49.5	233.1

NB: All other wildlife includes: deer, sambar, monkeys and porcupines.

The HWC Rapid Assessment clearly reflects the status of HWC in the Gewog. The low SAFE baselines for People (36%) and their Assets (33%) indicate that there are various gaps in current management to minimize and prevent conflict. As with other Gewogs in the HWC assessments, Habitats (80%) and Wildlife (67%) are considered relatively SAFE due to government regulation and protection, as well as religious sentiments. HWC Monitoring is also low (25%) due to the lack of hotspot mapping, understanding community attitudes to wildlife and HWC, and assessments of the severity and impact of conflict. The integrated nature of the current HWC actions across the Gewog is also very weak, with multiple criteria being met in only the Policy and Monitoring elements, and some criteria being met under the Prevention element. Draagteng scores high for Results Monitoring here as there is a good data collection mechanism already in place at the Renewable Natural Resources Office, though this will need to be integrated into hotspot mapping and the other five elements for it to become an integral part of minimizing conflict.

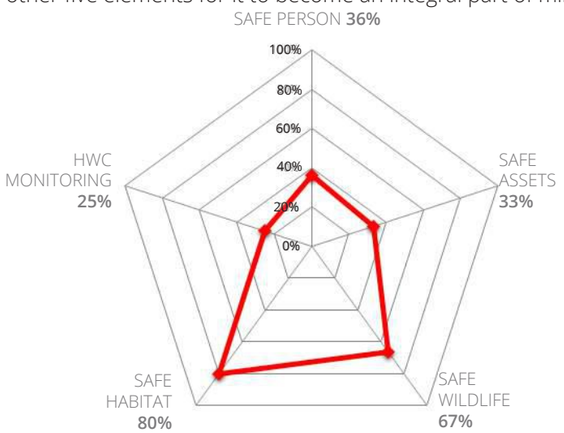


Figure 16: *SAFE baseline for Draagteng.*

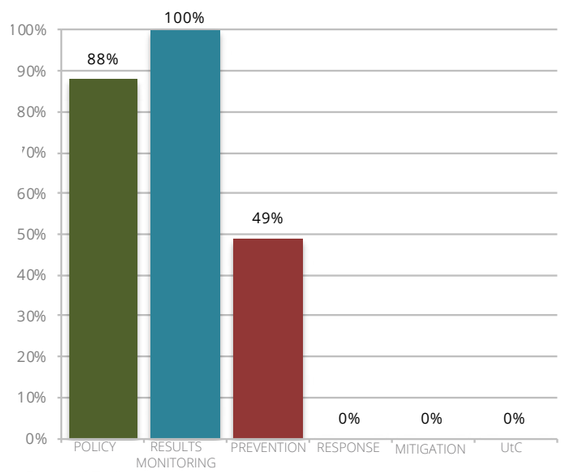


Figure 17: *Conflict Element baseline for Draagteng.*

Nubi Gewog, Trongsa Dzongkhag

Nubi Gewog is located at the northern part of the Dzongkhag covering an area of 55,440 ha and is the largest Gewog in the Dzongkhag. According to the Gewog Agriculture Extension Officer, the Gewog has 20 villages, 451 households, with a total population of 5,100 people. The Gewog is the most developed and the Dzongkhag headquarter is also located in this Gewog. The Gewog has access to most facilities compared to other Gewogs. While the Gewog has very conducive environment and climatic condition for agriculture farming, the main factors that constrain agriculture development in the Gewog are human-wildlife conflict, labor shortage and pest diseases. In 2015 alone, according to the data maintained by National Statistical Bureau, about 8.5 ha of crop was damaged by wild animals. To address this human-wildlife conflict, 64.22 km solar fencing has been already installed in the Gewog.

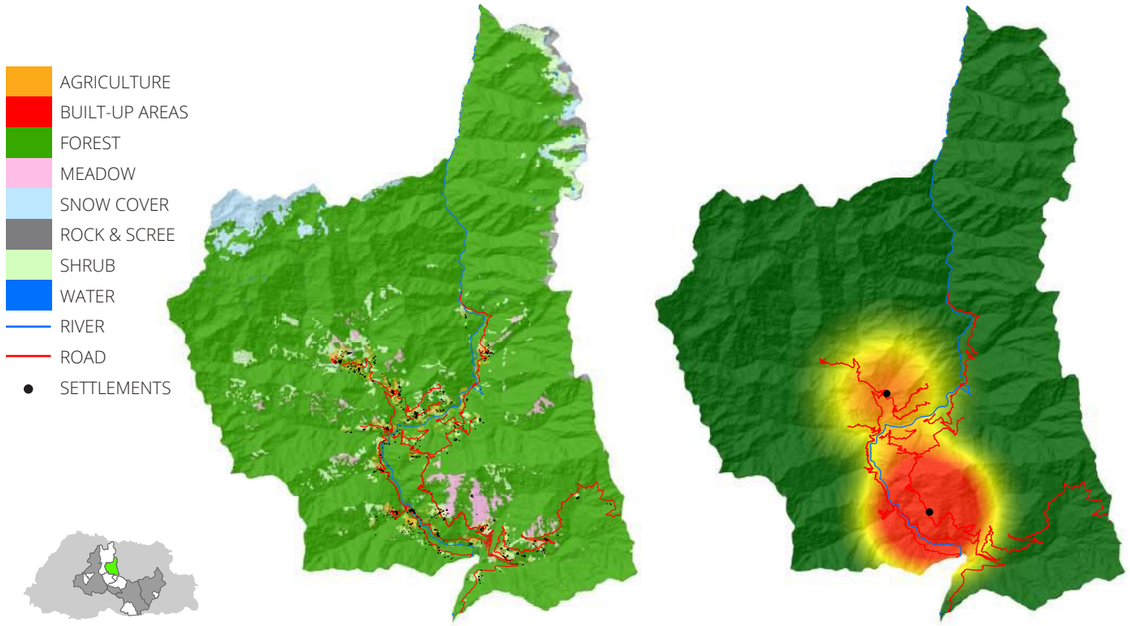


Figure 18. *Land cover and HWC hotspot map of livestock depredation in Nubi Gewog (MoAF 2010)*

As expected, the SAFE Rapid Assessment result showed that many of the components are relatively unsafe. The safest is the habitat (60%) followed by Wildlife (56%) and Assets (44%). The Gewog is unsafe not only for wildlife but it is equally unsafe for people (27%). This could be because of weak law enforcement coupled with limited mitigation and prevention measures in place. Regarding livestock statistics, there are 2,002 local breeds, 1,780 improved cattle and 108 yaks in the Gewog.

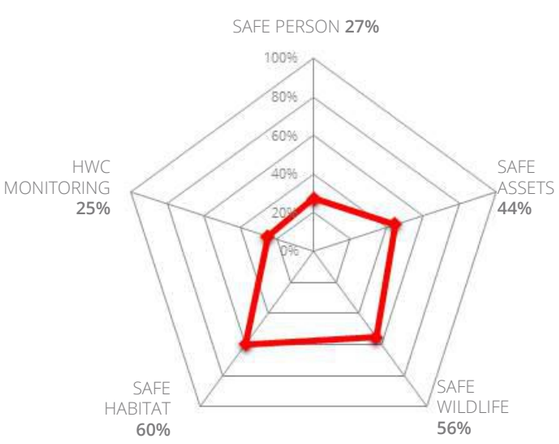


Figure 19: *SAFE baseline for Nubi.*

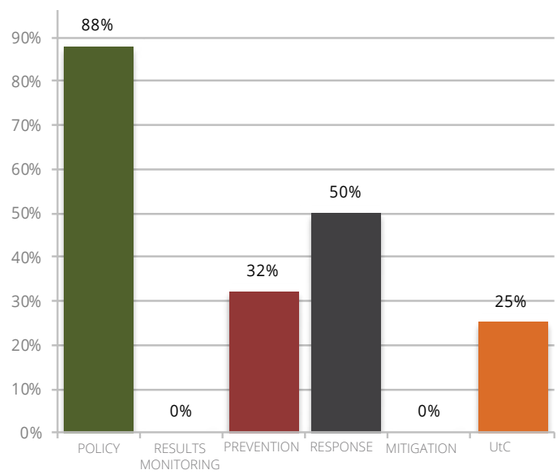


Figure 20: *Conflict Element baseline for Nubi.*

Langthil Gewog, Trongsa Dzongkhag

Langthil Gewog consists of 13 major villages with 698 households. The total population of the Gewog is 2757 of which 1336 are male and the rest women. The Gewog covers an area of 508.4 km² and it shares boundary with Tangsibji and Draagteng Gewogs to west and north, Korphu to the south and Zhemgang Dzongkhag to the east.

The Gewog has one RNR center, two BHUs and six numbers of Out Reach Centers (ORC) rendering basic services to the villagers. It has one Lower Secondary School, four community Primary schools and seven Non-Formal Education (NFE) centers providing education facilities in the Gewog.

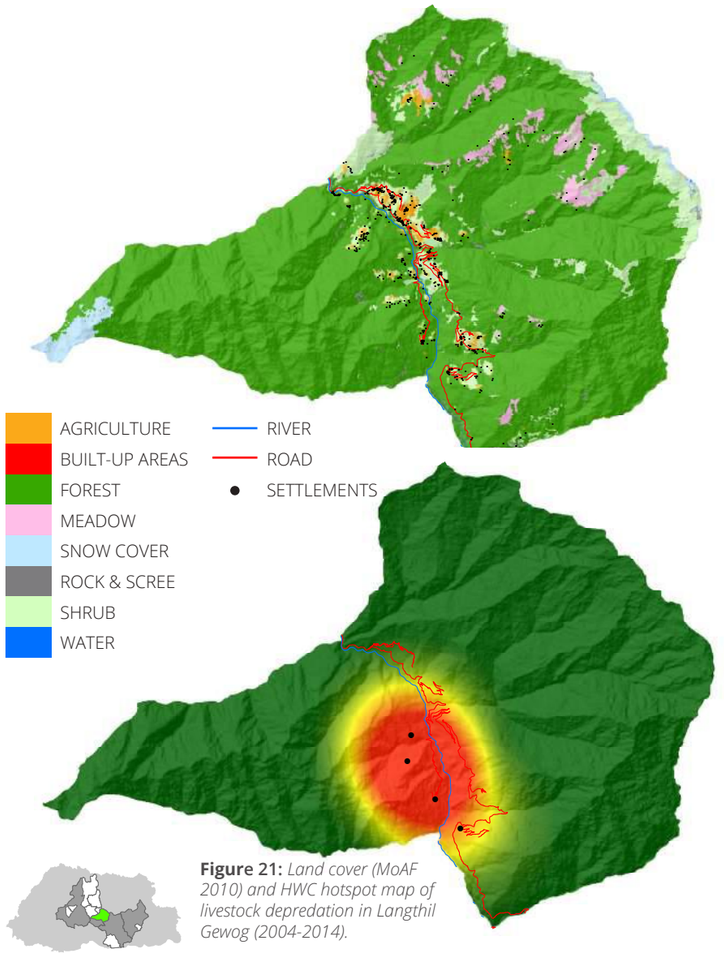


Figure 21: *Land cover (MoAF 2010) and HWC hotspot map of livestock depredation in Langthil Gewog (2004-2014).*

Trongsa-Gelephu highway runs through the Gewog connecting most part of villages and plays a vital role in the flow of economy. Though highway runs through the Gewog, most of the villages are still remote due to lack of farm roads. The Gewog has two-approach road and very recently one of the existing farm road is further extended by constructing a new farm road from Yurdungchholing village to Langthil village. There are nine farm roads with total length of 39.8 km and these roads connect different villages to the main highway.

The total dry land area of the Gewog is 338.5 ha and of the total, 91.1 ha are left fallow. Similarly, the total wet land area of the Gewog is 447.4 ha and of which 143 ha are uncultivated. Orchard and kitchen garden covers an area of 52.6 ha. Paddy, maize, wheat and vegetables form the major crops cultivated in the Gewog. Cash crops like oranges, banana and guava are also grown. In 2015, maize is cultivated on an area of 109 ha with a total production of 539.5 tons. Similarly, paddy is cultivated on an area of 185.7 ha with a total production of 726.4 tons. Area covered by other cereals are relatively smaller compared to maize and paddy. Other crops grown in the village include, oilseed, pulses, and legumes.

Like in other parts of the Dzongkhag, human-wildlife conflict is a major constraint in the Gewog. According to record maintained by Dzongkhag Administration, in 2015 alone, about 24 ha of crops with total production of 28 tons were damaged by wildlife. As in other places, wild boar is the main wildlife causing extensive crop lost. As locally fabricated electric fencing has become the choice of the farmers and the government, a total of 9.5 km solar fencing has been established in the Gewog.

In line with the Dzongkhag record, the SAFE Rapid Assessment results showed that, both wildlife and habitat are much safer than other components of the system. While Safe wildlife scored 89% and Safe Habitat scored 80%, Safe Person and Safe Assets scored 39% and 33% respectively, indicating that both human and their assets are not safe. On the other hand, the results also showed that there is no monitoring and evaluation being carried out in this Gewog in relation to human-wildlife conflict and associated activities implemented. Higher scores for Safe Wildlife and Safe Habitat could be because of the fact that there is strong law enforcement as this Gewog is located inside the park.

Livestock animals in the Gewog consist of cattle, horses, poultry and goat. According to the record maintained by the Dzongkhag Administration, there are 3,089 local cattle, 473 improved cattle, 98 horses, 6,545 poultry and 481 goats in the Gewog in 2015. According to the record maintained by Jigme Singye Wangchuck National Park (JSWNP), a total of 15 cattle were depredated by wild dog, 12 in 2004, 1 in 2008, 1 in 2010 and 1 in 2013. These 15 cattle included 9 oxen, 2 cows and 4 calves and of the total, 13 cattle were killed by wild dogs and 3 by tiger.

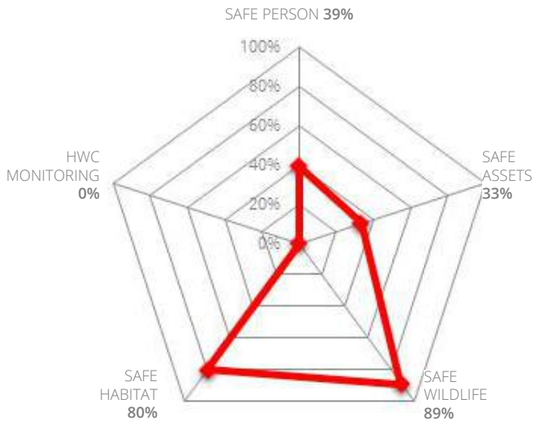


Figure 22: *SAFE baseline for Langthil.*

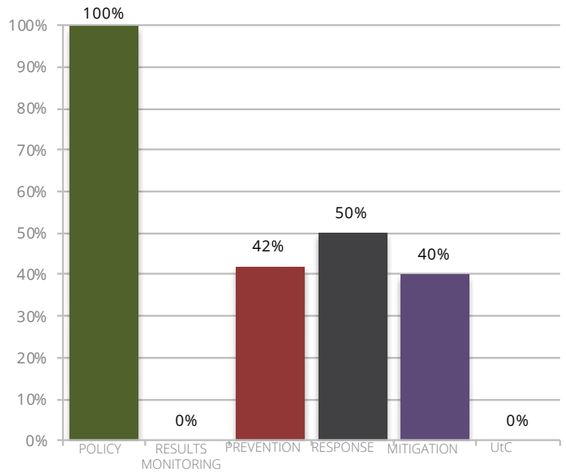


Figure 23: *Conflict Element baseline for Langthil.*

Tangsibji Gewog, Trongsa Dzongkhag

According to the record maintained by Dzongkhag Administration, the Gewog consists of seven villages, 359 households with a total population of 1,848 people. It covers an area of 37,160 Ha and the Gewog borders with Wangdiphodrang Dzongkhag to the west, Langthil Gewog to south and Draagteng Gewog to the east. The east-west highway runs through the Gewog and acts as a main artery for economic development. Most part of the Gewog is still very remote with only 5 farm roads connected to few villages.

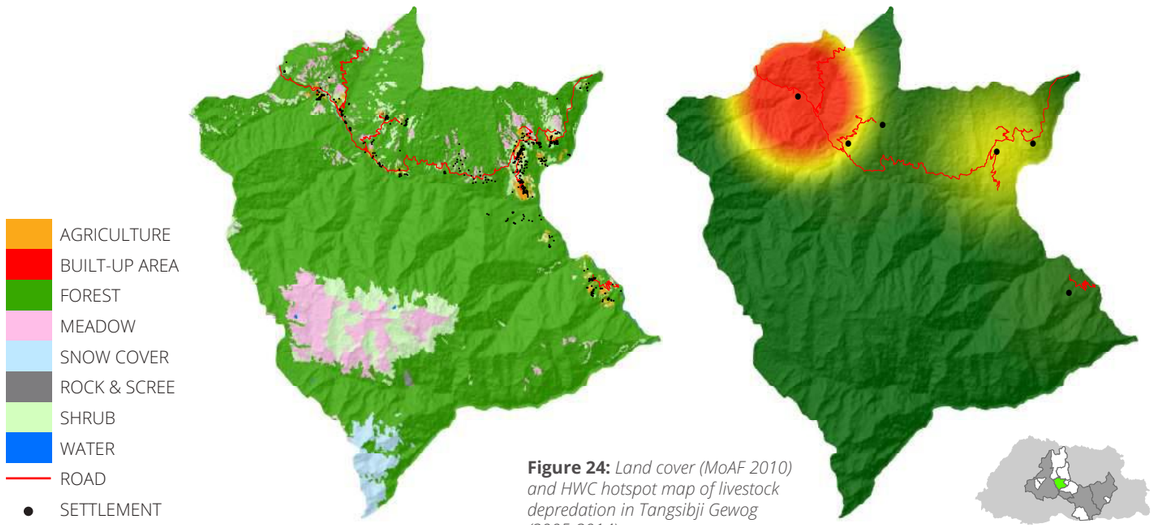


Figure 24: *Land cover (MoAF 2010) and HWC hotspot map of livestock depredation in Tangsibji Gewog (2005-2014).*

Major crops cultivated in the Gewog are maize, paddy, wheat, barley, buckwheat and other minor cereals crops. In 2015, paddy is cultivated on an area of 62 ha producing total paddy production of 228 tons. Other cereal crops like wheat, maize and barley covered about 56.2 ha in 2015. Because of the conducive climatic condition, a wide range of fruit crops and vegetables are also grown in the Gewog.

According to the record maintained by National Statistical Bureau about 4 ha of crop were damaged by wild animals in 2015 alone. Further, the Rapid Assessment results also showed low scores for both Safe Person (27%) and Safe Assets (22%). On the other hand, the assessment results revealed habitat as safe with 100% score. However, for the Safe wildlife, the score is only 56%, indicating that safe habitat do not necessarily mean that wildlife is safe from poachers and hunters. Unlike in other project site Gewogs, in Tangsibji, the assessment result showed monitoring and evaluation being carried out although the score is only 25%.

The Gewog has higher number of improved cattle breeds than local cattle. The total number of improved cattle population in the Gewog in 2015 was around 1,060, while local cattle population is only about 562 head. Other livestock animals in this Gewog include poultry and goats. As in other Gewogs, a total of 22 livestock were depredated by wildlife between 2005 and 2013 in Tangsibji Gewog. The depredated livestock included 2 mules, 3 horses, 9 oxen, 7 cows and 1 calf. Unlike in Langthil, in Tangsibji Gewog, majority of the animals were depredated by tiger while few were killed by leopard.

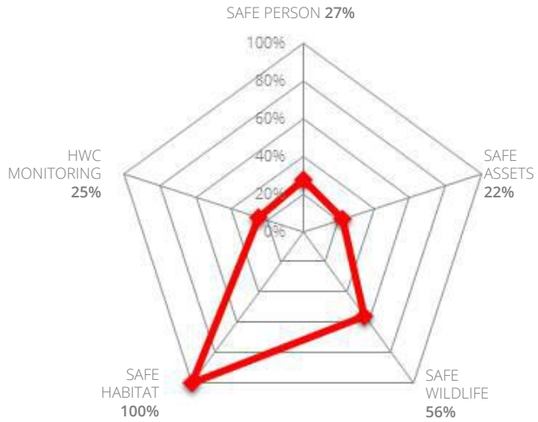


Figure 25:. *SAFE baseline for Tangsibji.*

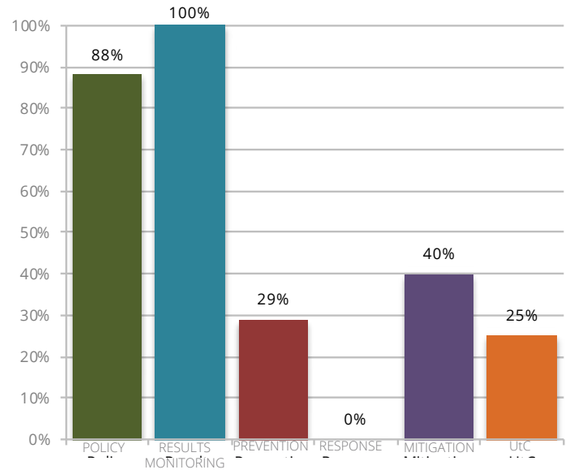


Figure 26: *Conflict Element baseline for Tangsibji.*

Kengkhar Gewog, Mongar Dzongkhag

There are six villages within Kengkhar Gewog, with a total population of 3,886 within 437 households and across 8,815 ha. The agricultural area is about 306 ha while forest cover is about 8,029 ha (PPD, 2013). The Gewog is famous for making and selling wood crafts. With the support from the Tarayana Foundation, the Gewog is given permission to obtain wood from anywhere in the country. With the support from the Mountain Hazelnut Venture Private Limited, the first Foreign Direct Investment in the country, farmers have planted 18 Ha of hazelnuts. There are also two community forests in the Gewog.

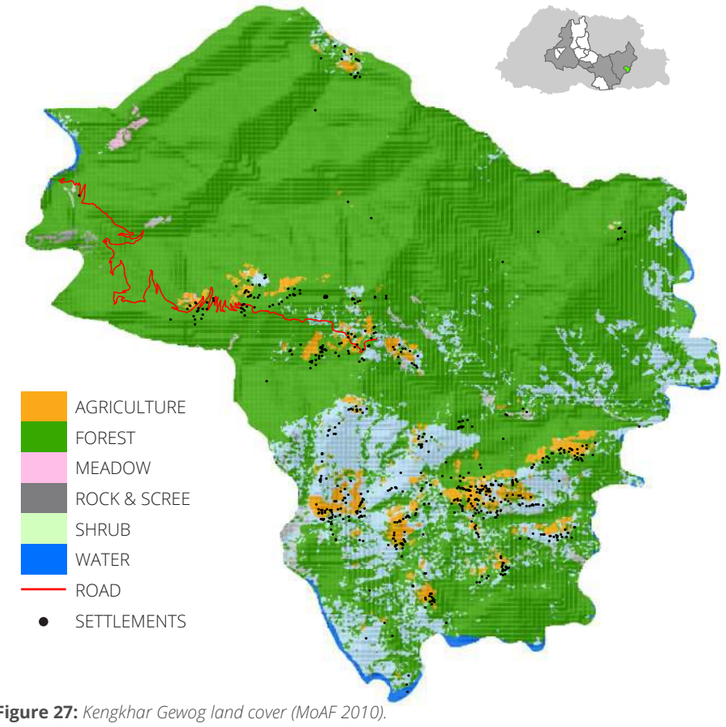


Figure 27: *Kengkhar Gewog land cover (MoAF 2010).*

Maize is the only crop grown for consumption and sometimes used as a livestock feed or brewing local alcohol. In 2012, the area under maize production was 233 ha with total yield of 593 metric tons (PPD, 2013). A smaller income stream is derived from potatoes and chilies.

Livestock rearing is also very common in the Gewog. It is a source of cheese and butter for household consumption, as well as for sale. There are in total 1,281 head of cattle, including both local and improved breeds. In addition to cattle, horses are reared for transportation purposes, and 30 poultry farms are operational (DoL 2015).

Human-wildlife conflict is an important issue in the Gewog. Wild pigs, monkeys, langurs, porcupines, barking deer and sambar deer attack maize when at the milking stage. Farmers guard maize crops day and night and still lose 50%. In terms of financial losses this amounts to around Nu. 25, 000 – 30, 000 per year. The remaining 50% is just enough to feed the family for six months. The rest of the months, farmers work as hired laborers and get paid in cash or kind. Guarding is also very difficult. The guarding coincides with the rainy season and associated spikes in leaches and mosquitos which creates problems to go to the field and guard. The Gewog is very popular for lay monks. Lay monks wander in the villages begging for food or conducting rituals and only elderly women are left behind. It is difficult for women to guard at night without a companion or their spouse.

Livestock predation by wildlife is also a problem in the Gewog. Leopard and wild dogs are the two main predators in the Gewog. Over 10 years, the Gewog has lost 28 cattle (seven due to leopard, and 21 due to wild dogs). However, farmers feel now the kills have declined because of the reduction in use of local breeds as per the national policy. In some areas, HWC has become too much and some farmers feel they can no longer tolerate the conflict and desire hunters to be present in the Gewog. However, farmers also support conservation. They feel, at one time there was a tiger in the vicinity which helped to chase away wild pigs and deer. One remarkable action taken on conservation by the farmers is not allowing the farm road to pass through the nests of hornbill. The Gewog has not seen human casualties due to conflict so far.

The HWC SAFE Baseline for the Gewog mirrors the other target Gewogs. The most unsafe parts of the system are the People (31%) and their Assets (13%), and an understanding of hotspots and community attitudes overall is also low (HWC Monitoring 25%). 80% of criteria for Safe Habitat are being met, while Wildlife are also relatively safe (56%). Enhanced protection of crops, which will in turn ensure people are buffered against the impacts and shocks of HWC will need to be a focus of the HWC Strategy in this Gewog.

Kengkhar Gewog also has relatively low integration of activities currently being implemented across the Gewog in HWC Management. There is currently no participation in any compensation of insurance schemes, and no research into the conflict profile (Understanding the Conflict). Results Monitoring is high due to the existence of a data collection mechanism, which will need to be integrated and serve reinforce the other effectiveness of the other elements.

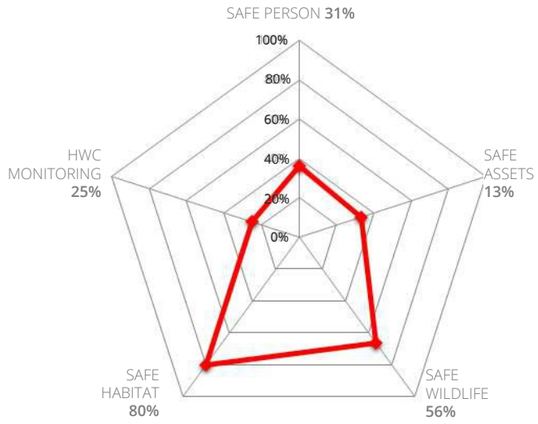


Figure 28: *SAFE baseline for Kengkhar.*

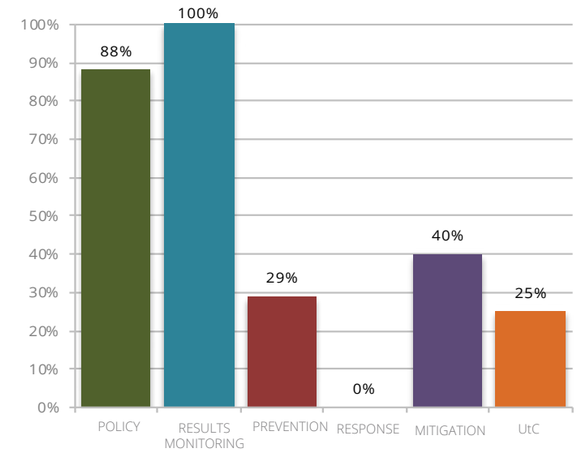


Figure 29: *Conflict Element baseline for Kengkhar.*

Phangkhar Gewog, Zhemgang Dzongkhag

Phangkhar Gewog is within the Royal Manas National Park. The Gewog comprises 1,558 people across 12 villages. Of the total area (52,645 ha), 325 Ha is agriculture and the remainder (48,957 ha) is natural forest (PPD, 2015). Crop production and livestock rearing are the two most important economic activities. In 20, the Gewog produced 26 metric tons of paddy from 7.7 Ha of wetland. In the same year, 1,096 metric tons of maize was produced from 368 Ha (PPD, 2013). Maize is usually consumed as grits or used for making local alcohol. The extracts from the maize alcohol is fed to the cattle as feed. Farmers produce two maize crops annually, the crop planted in May and harvested in August, and the second planted in August and harvested in September.

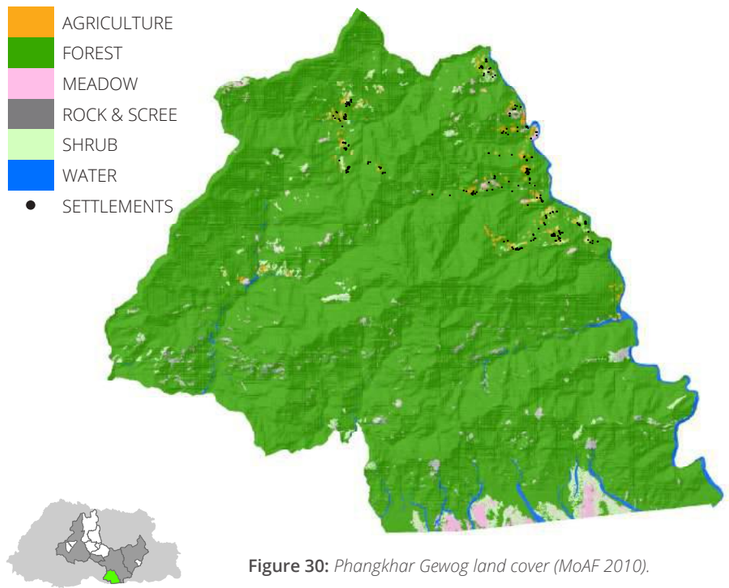


Figure 30: *Phangkhar Gewog land cover (MoAF 2010).*

Livestock provides butter and cheese to the farmers as well as sold at market. In 2015, the Gewog had 1,165 head of cattle, 183 horses and 169 domestic pigs (DoL 2015). Some villages in Phangkhar Gewog are still not connected by farm road. For instance, the Pongchola village (a target for the HWC project) is still not connected by farm road. In places like this, horses are the key mode of transport of goods through which people earn cash.

32 participants from the Pongchola village were consulted on the seriousness of HWC in their village. According to these farmers, wild boar, barking deer, sambar deer, bear, wild dog and tiger and porcupines are the key HWC issues to crops and livestock. Wild boar reigns high in terms of crop losses.

Even when crops are guarded farmers lose around 50% of their production. On an average, farmers spend two months guarding maize while 2-3 months guarding paddy. HWC has led the village to leave around 8 ha of dryland fallow. Indirect impacts of so much HWC in the Gewog are that farmers often need to guard crops at night and experience lack of sleep and tiredness the next day when they need to continue to work. Livestock predation by wild carnivores like bears, leopards, wild dogs and tigers are alarming the farmers in the village. In one week, two farmers lost three cattle to wild dog and tiger. Most of the livestock get killed in the forest. Farmers are compensated for the loss, especially when killed by the tiger but not for kills made by other predators.

The results of the Rapid Assessment are consistent with the other target Gewogs, and consistent with the intensity of the HWC in the Gewog. People (24%) and their Assets (11%) are the weakest parts of the system, while Habitat (100%) and Wildlife (67%) meet most of the criteria for safety. Similarly, there is little integration of HWC actions across the Gewog, where the Gewog meets almost all criteria for Policy and all the criteria for Results Monitoring, but scores low on Preventative measures (32%) and has some mechanisms to respond to conflict (25%), and undertakes no research into the conflict profile (0%), nor has any participation in compensation or insurance schemes (0%).

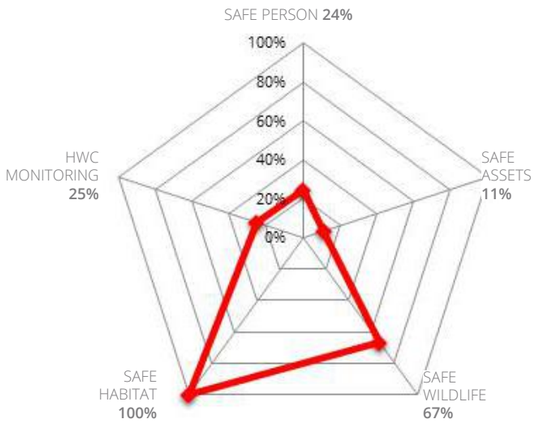


Figure 31: *SAFE baseline for Phangkhar.*

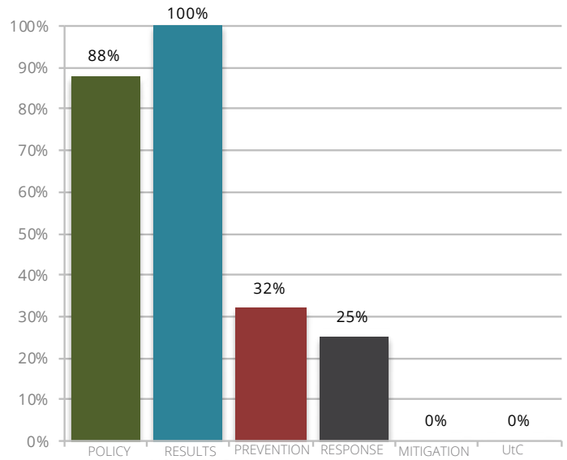


Figure 32:. *Conflict Element baseline for Phangkhar.*

5 THE SAFE SYSTEM STRATEGY: NINE GEWOGS

5.1 The approach

The Strategy follows the **Safe System approach** (Brooks 2015). This means that management actions are guided toward making the overall site, landscape or area safe. The approach is results-focussed and delivered through five Strategic Outcomes: **safe person, safe wildlife, safe assets, safe habitat, and effective monitoring**. This is a paradigm shift away from existing approaches to human wildlife conflict globally that address individual Conflict Elements only, and have no way to address the safety of the system into the future. Calls are often made within HWC strategies to "resolve" and "mitigate" conflict, though these only address part of the problem and at only specific times of a conflict event.

The approach ensures that: a) all six elements of HWC are integrated, b) that the Strategic Outcomes act as minimum standards for HWC management, and c) that if each of the five Strategic Outcomes are met, then contact between humans and wildlife is minimized, and both can be safe in the event of contact within acceptable limits of tolerance.

5.2 Safe System principles

A Safe System approach to HWC: provides an **holistic** view of the conflict in its entirety; is **inclusive** in that it encompasses all the interactions between the people, their land, their livelihoods, decision-makers, commercial and government interests, and wildlife; and is **forgiving** as it accommodates human error and the "wildness" of the species involved. The Safe System approach has four guiding principles (Brooks 2015):

1. It recognizes that wild animals are wild and conflict will occur. When conflicts occur however, the interventions across the system should ensure that the impact of an incident does not exceed the limits of community tolerance, and does not result in retaliatory killing.
2. It stresses that individuals, communities, leaders and the public involved in the design of the system need to accept and share responsibility for the safety of the system, and those that use the system must accept responsibility for complying with the rules and constraints of the system.
3. It aligns conflict management decisions with wider development plans and processes that contribute to economic, human, and environmental goals.
4. It guides interventions to meet the minimum standards and long term goals, rather than setting specific targets.

5.3 Interventions

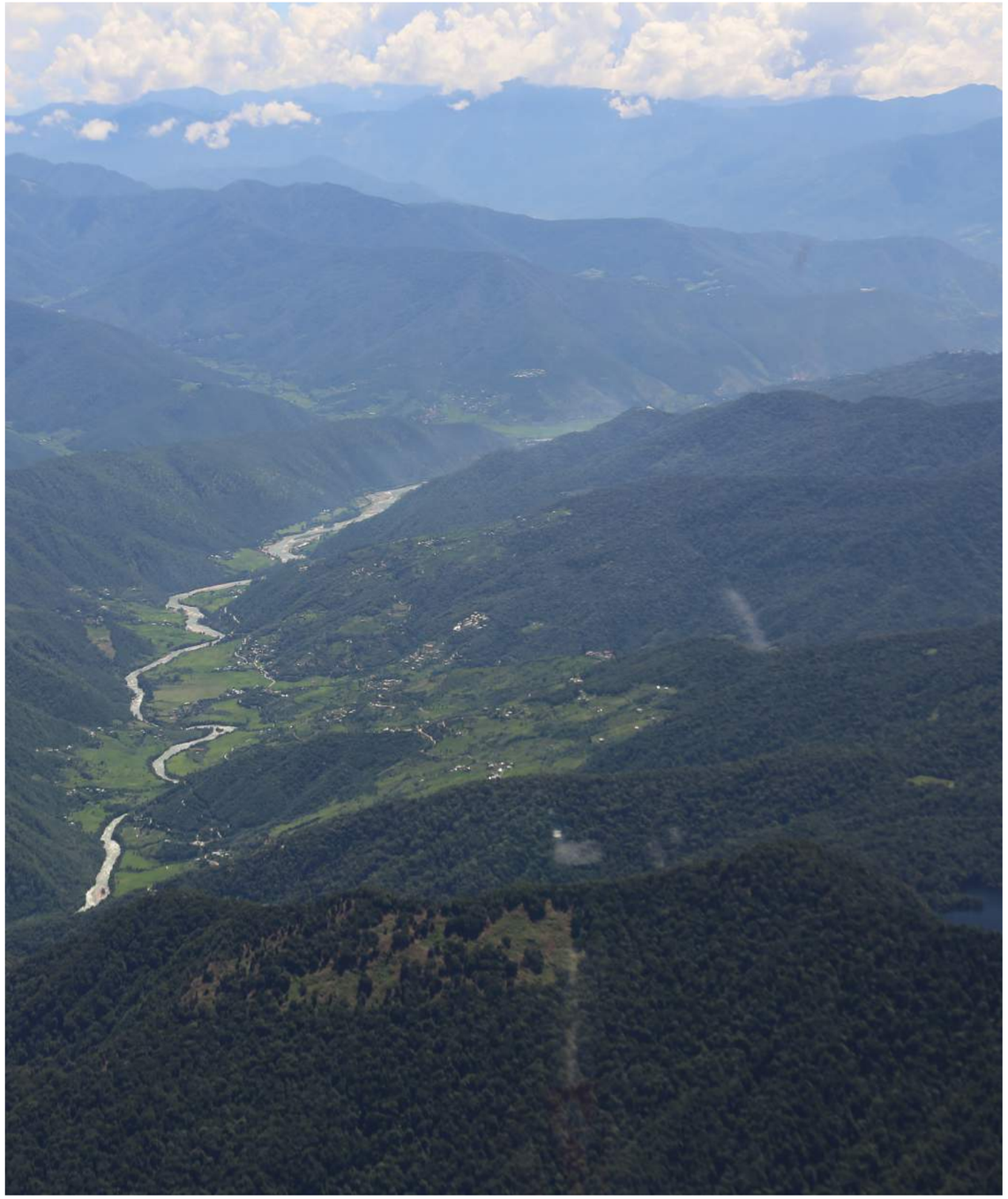
Making 'human – wildlife systems' safe involves making the four components of the system – people, wildlife, assets and habitat – safe. The safety of these four components is therefore the cornerstone Outcomes of the entire approach. Each Strategic Outcome is guided by Strategic Intents. If these Intents or minimum standards can be met through locally applicable means and actions, then the system becomes safe, and co-existence between humans and wildlife can continue without detriment to either.

Table 6: *Strategic Intents contributing to the Safe System.*

STRATEGIC OUTCOME	STRATEGIC INTENT
Safe Person	• Does not hunt wildlife; practices wildlife friendly farming; has access to funds to develop local preventative solutions; has more than one income stream; reduces reliance on conflict prone incomes; participates in an insurance scheme; reports all HWC events; is supported by a Response Team; has access to conflict information; participates in conflict education; participates in a HWV management plan.
Safe Wildlife	• Is protected under law and is safe from hunting and habitat loss; has access to sufficient habitat, fodder and prey; does not have access to domestic livestock or crops; is separated from people via barriers, deterrents and land use plans; is not attracted to anything in human settlements; makes a positive contribution to local livelihoods; is supported by Response Teams; and is treated and monitored in the event of injury.
Safe Assets	• Are separated from wildlife by barriers, deterrents and land use plans; follows a wildlife-friendly grazing and cropping plan; are guarded during the day and protected at night; livestock graze in agreed areas; crops have buffers around them; are protected against invasive species (plant or animal) through active management and buffers.
Safe Habitat	• Is protected under law; houses wildlife that are protected; is recognized in, and managed in accordance with a spatial plan; is large, connected and not shrinking.
Effective Monitoring & Evaluation	• Conflict hotspots are known, mapped, and modeled regularly. • There is clear understanding of the actual and relative human and financial cost of conflict locally. • Community attitudes and tolerance for wildlife is known. • There is clear knowledge if programs are achieving the desired goals.

The sections below describe in detail the overarching direction and actions that will be taken across the nine Gewogs to achieve each Strategic Outcome and begin to foster Safe Systems at all scales.

- **Directions:** Describes the overarching direction and goals to be achieved in the Strategy.
- **First Steps:** Details the actions to be taken at the outset and to be achieved in the first three years of the Strategy.
- **Future Steps:** Gives an overview of the options to consider in the longer term.
- **Measuring progress:** Gives an overview of the indicators for measuring progress toward reaching each Strategic Outcome.



6 SAFE PERSON

6.1 Introduction to the context

Human casualties resulting out of conflict is the extreme form of HWC. While the loss of crops and livestock can be tolerated, loss of peoples' lives is beyond tolerance and puts the conflict to a different level. Even a single loss of live is enough to instill animosity towards wildlife and conservation and retaliatory killings could take place, defeating the sole purpose of conservation goals. The success of conservation depends on peoples' attitudes and behavior towards wildlife, which is shaped by the degree of conflict. In Bhutan, since 2010 – 2015, 25 people have lost their lives. The highest loss was due to the Himalayan black bear (17) followed by wild pigs (4), elephants (3) and common leopard (1) (http://www.kuenselonline.com/review-human-wildlife-conflict-strategy-say-foresters/).

People interact with wildlife in many ways – either directly through hunting or chasing the wildlife from the field, protecting the livestock or indirectly through accidental encounters such as while collection of non-wood forest products or travelling. In either case, the result can be an injury, death or escape. The Safe System approach seeks to make people Safe to live and engage in their livelihood activities in the landscape they live in. Since the people are the main players in the conflict, they are the critical part of the overall safety of the system. Safe People in Safe System language means people are complying with laws, take responsibility for preventing conflict and participate in conflict management while they are financially buffered from the shocks of conflict events.

Ensuring people and their livelihoods are safe is fundamental to effectively managing conflict in the long term. The safety of people is paramount when we consider that it is their tolerance of wildlife that reduces the tendency for retaliatory killings in an area, and maintains government support for conservation programs. This Strategic Outcome – Safe Person – is therefore a critical part of the overall safety of the system.

Safe people are those that comply with laws, take responsibility for preventing conflict and the system overall, are financially buffered from the shocks of conflict events, and take an active role in the community for conflict management.

A Safe Person is one who complies with the laws relating to species, wildlife and habitat protection. The person has contributed to a spatial plan of their area and complies with agreed grazing regimes, crop management and livestock management.

A Safe Person has access to micro-credit or funds to develop innovations and ideas for conflict prevention, and can access technical support to refine, upscale and market their ideas/technology. As a result of the use of preventative measures and learning from others, a safe person is one where their assets are safe and protected.

A Safe Person is financially buffered from conflict events by having multiple income streams, and those that are not prone to conflict. A Safe Person also has access to jobs, healthcare and education. They are also participants in some form of insurance scheme (state, corporate or locally run) that allows them access to relief or compensation if their crops or livestock are lost, or ex gratia if a family member is lost or injured and cannot contribute to household income. Membership of the scheme and rules governing access to compensation are conditional based on the person's adherence to agreed behavior within the scheme[2]. Conflict events therefore have minimal disruption to people's lives and livelihoods and the response to events is therefore not disproportionate to the incident, because perceived risk is minimized.

A Safe Person actively uses a local reporting system every time they experience a conflict event, and they make use of local information regarding conflict and lessons from measures taken in other places. They are active participants in community education and awareness raising on wildlife, conservation and conflict and contribute as required to conflict monitoring programs. They are either a member of a trained Response Team or know of people that are members[3].

A Safe Person participates in and contributes to a local HWC Management plan.

[2] The compensation scheme will be linked to a conservation outcome. In order to get compensation the person must adhere to the rules of the scheme. i.e. if livestock is lost to a conflict event while it was being herded by a person outside a protected area, then the person would receive full compensation. If the livestock was lost while straying inside the protected area then the owner forfeits their right to access compensation under the scheme as the straying cow was in breach of the rules of the agreement.

[3] Knowing people who are in Response Teams is an indicator of proximity of the Response Team to the community.

6.2 Evidence – what is known (lessons from the field)

Compliance

A critical and overarching part of the Safe System is that people and communities comply with established laws prohibiting hunting of protected species, and clearing protected habitat. Animals injured in botched poaching attempts by snares or bullets, are also a common reason for predation of livestock or attacks on humans, plus poachers are exposing themselves to contact and conflict with wildlife when they spend time hunting and clearing of habitat (DTCP 2009, Goodrich 2010). Law enforcement and prevention of poaching is therefore a key part of reducing HWC.

Compliance and anti-poaching efforts under this Strategy will be undertaken in accordance with the six pillars of the Zero Poaching Strategy[4]. Typically enforcement will be undertaken by the relevant protected area authorities. However, local communities are also a critical partners in zero poaching efforts. First through direct action such as snare removal and ceasing illegal collection of forest products. And second through participating in informant and monitoring networks, to report poaching, clearing and injured wildlife activities (WWF *et al*. 2015).

Wildlife-friendly farming

Crop raiding and livestock depredation are persistent challenges for pastoral communities worldwide (Miller 2014). Various approaches are used for reducing the conflict. The most cost efficient and effective action is prevention through use of barriers, designated grazing areas, guarding of crops and livestock during peak HWC periods, use of improved breeds and cropping techniques.

Innovation funds

Successful innovations for preventing HWC are rarely scaled-up, developed, refined or taken up at other sites due to a lack of funds. Successful innovations across Asia have been limited in their growth by the lack of refinement, the costs of upscaling, or have had minimal exposure and uptake at other sites.

Locally managed Innovation Funds designed to provide seed funding for actions in HWC prevention could go a long way to fostering prevention and reduction of HWC, and also to support the development and refinement of local solutions. Such a Fund could also provide capacity building in areas of small business management and product marketing to get ideas off the ground. In order to build in sustainability of the Fund, it could be designed in partnership with multinational donors, national companies or locally-based private sector. Co-contribution to the fund can therefore link local businesses and livelihoods with HWC prevention. For example, hotels in a high HWC and tourism area might contribute into the Fund which has flow-on benefits to their business through reduction of HWC events and maintenance of local tolerance for wildlife. The design of the Fund will be locally specific, but should be designed with permanence in mind i.e that it is a revolving or non-sinking Fund linked to an insurance scheme that is able to provide support in the long term. There could be specific calls for applications from grants from locals each year, or it is open for applications at all times.

UNDP's Tiger Challenge Scheme in Malaysia

The UNDP supported Central Forest Spine project in Malaysia is piloting the Tiger Challenge scheme in order to incentivize stakeholders from government to communities to take part in tiger conservation through devising methods for preventing HTC.

Winners of the challenge will be given a grant to implement their scheme, resulting in a potentially effective preventative measure and increased interest and support for tiger conservation. An emphasis will be placed on the involvement of local communities in this scheme.

[4] *PILLAR 1: Assessing Current Enforcement Operations and Methods; PILLAR 2: Introducing Appropriate Technologies for Site-based Enforcement; PILLAR 3: Improving Institutional Capacity Building and Coordination; PILLAR 4: Increasing Involvement of Communities and Other Partners; PILLAR 5: Strengthening Prosecution for Wildlife Offenses; PILLAR 6: Strengthening and Improving Regional Cooperation WWF, GTF, NTNC and SAWEN (2015). Symposium: Towards Zero Poaching in Asia Pre-Symposium Draft Toolkit, WWF, GTF, NTNC, SAWEN.*

Livelihoods

Almost all conflict landscapes have active government and NGO programs in support of livelihoods development, market access, and public service support. The success of such programs is critical for buffering individual and household incomes from the shocks associated with conflict events. Some livelihoods activities can also have dual benefits for incomes and conflict reduction. In Nepal, the adoption of biogas stoves in various places has also meant that villages do not need to spend long amounts of time in the forest collecting firewood for cooking and has also reduced the incidence of HWC in those areas along the Terai Arc Landscape (Dhungana 2014). Livelihood actions to support diversion away from high conflict risk livelihoods should also be explored.

Insurance and compensation

Insurance schemes reduce the incidence of retaliatory killings by mitigating the impact of conflict after the event. They also help to manage local perceptions of risk. If people perceive that a conflict event will have a significant impact on their lives, there will be a tendency for a disproportionate response to any event in order to reduce future risk of it happening. Insurance schemes across Asia are either locally or government managed, have full or only partial community participation, and have various design features. In buffer zone communities of Royal Manas National Park, the park authorities deposit seed money into a term deposit. Interest from this account, along with the premium paid by local people into the scheme every two years is then used to compensate for losses from conflict events. The scheme is therefore self-sustaining.

Community-based livestock and crop insurance in Bhutan.

Due to the multiple conflict species context of Royal Manas National Park, and the multiple communities residing within and adjacent to the park, it was necessary to develop an insurance scheme that matches these local realities. Participating communities are covered for up to two years for their insurance payments that cover livestock and crop loss. Compensation payments are linked back to behavior and management changes. For example, payments for guarded crops that were lost are 60%, while unguarded crops lost will only receive 40%. The incentive is, therefore, to put in place preventative measures. The challenges to the scheme include: not enough seed funding; complex conflict profile; and the challenges of working with rural communities with low literacy and education levels. The strengths of the scheme are: participating communities are small and homogenous; high level of local support and a willingness to compromise; and the local ownership and management of the scheme (the community management committee meets annually).

Reporting

An effective HWC management program requires a rapid reporting system to allow fast responses, and to ensure conflict data is captured and fed back into the program. If local people are not able to quickly report incidents then the entire management system can break down. In Indonesia, a communications program was developed whereby conflicts were reported to a 'Conflict Hotline' phone number (Nugraha *et al*. 2009). In Zimbabwe and Mozambique an SMS-based national system was developed which offers potential. The system was able to receive information from a field-based officer, confirm receipt of the message, insert the data into a national database and, depending on the importance of the problem, alert, by SMS, the relevant services so they could react immediately (FAO 2012). In Indonesia, the NGO coalition developed an online portal to capture HWC incidents. This is a low cost, highly accessible way of collating and managing data, though needs ongoing support to keep it running. If this system could be integrated with an SMS-based reporting mechanism, coupled with locally-based Response Teams in hotspot areas, then it could prove a cost effective reporting and information management system.

Lessons suggest that viable reporting systems must be: user friendly and bottom-up; site-based; fully resourced with capacity, tools, funds and local willingness; linked back to compensation / incentives and rapid responses; time bound; and linked to preventative measures (WWF-TAI *et al* 2014).

Response Teams

Response Teams are at the front line between the forces of wildlife conflict and wildlife conservation. If Response Teams are not present shortly following an incident, the chance of an adverse outcome for people and the animal increases, and chances for an agreeable management response diminishes. The effectiveness of Response Teams

will be determined by their ongoing training, their community and government support, the speed of their response, and the structured protocols (decision trees) that guide their response actions. Deciding on how to respond to HWC events, and differentiating isolated from repeat incidents requires the development of a well-defined decision tree process that allows Response Teams to quickly reference and take action (Nyhus *et al*. 2004). Formalization of such protocols (NTCA 2013) and decision trees (Nugraha *et al*. 2009) will also provide legal protection to teams when HWC events arise (Goodrich *et al*. 2011). The work of Response Teams is readily retrofitted to the work of existing PA rangers and law enforcement agencies. Where these may not be located proximate to conflict hotspots, then Response Teams can be established to conduct dual roles of HWC and protection.

Access to information

People must have access to conflict information in order to adapt and plan over time. The information will have two reinforcing purposes. First that local people understand the immediate and current issues and trends in their communities around HWC. And second, that people have access to lessons from further afield in order to adapt and apply locally.

An effective local information system will make regular public reports available through locally applicable means such as newspaper, public notice, management web site, SMS, email, and management reports. The information should include recent events, hotspots, local solutions, trends etc. and come from management and local people alike. There should also be a focus on reinforcing and fitting into any cultural, religious or traditional information systems and solutions around conflict. The information system should also include ongoing education on species and wildlife, monitoring, patrolling, citizen science and done through schools, and through locally applicable community events and forums.

In order to enhance the sharing of lessons and scaling up success, communities need to have access to lessons and approaches from other areas and landscapes. Platforms such as online portals/web pages could be developed to share information, while a suite of existing mechanisms could be used to avoid issues around lack of internet access in many areas. These include: workshops / conferences; journals, reports and brochures; magazines, TV, film, and newspaper; field days, site visits and personal introductions.

Community participation

Communities are at the core of HWC management, without active participation much of the strategy is weakened. Community participation is what drives the effectiveness of the rule of law, intelligence gathering, insurance and compensation schemes, reporting, innovation funds, Response Teams, monitoring and evaluation, and education systems. If communities do not participate, then HWC minimization and flow-on benefits to communities cannot be demonstrated. Evidence already suggests that 'trust' is a critical element lacking in HWC management programs particularly around Response Teams and the processes of accessing compensation. The more that communities are involved in decision making processes and development of local ideas, the more that trust can be built. Communities will need to be incentivized to actively participate and take responsibility for the Safe System. Regular community reporting on success and impacts to locally relevant priorities will be a key part of this.

6.3 Directions – what the Strategy aims to achieve by end 2023

- National level outcomes:
  - Policy on **insurance and compensation schemes**
  - Develop national policy for **ex gratia payment**
  - Establishment of HWC **Innovation Funds** with banks, WCD, micro credit agencies and private sector
  - National **policy and mandate for Response Teams**
  - Accepted national Response Teams – **Decision Trees and Operating procedures**
  - Establishment of a national **reporting mechanism**
  - Establishment of a national **HWC database**
  - Establishment of a national **HWC Committee**
- All nine Gewogs to:
  - Ensure **alternative livelihoods** programs are in place and ongoing
  - Have operational **insurance** schemes linked to prevention
  - Have **informant networks** in place and functioning
  - Have **wildlife friendly farming** strategies and actions in place
  - Have access to **funds to support prevention** and innovation
  - Have an operating, and highly utilized, conflict **reporting system**
  - Have locally-based, operational **Response Teams**
  - Have conflict **information systems** readily accessed by local communities
  - Have **HWC Management Plans** developed and implemented
  - Have **community education** manuals and resources developed and updated

6.4 First Steps – actions in the first three years

PROPOSED ACTIONS

A. Enhancing community forest patrols	NATIONAL LEVEL	GEWOG LEVEL
1. Gap analysis of current coverage, intensity and training needs for community patrols in 9 Gewogs. 1st year.		
2. Support filling of resource and technical gaps for community forest patrols identified in gap analysis. 1st year.		
3. Integrate patrol plans in community forests with patrols in adjacent protected areas. 2nd year.		

Critical design features

- Ensure that community patrols complement and are integrated into the patrolling plans of Protected Areas in that Gewog.
- Where possible use and strengthen existing community forest groups and incentivize them.
- Form new community forests groups as required based on the gap analysis and provide incentives to participate.
- Incentives can be in the form of free services in areas like solar, radio, cgi sheets, biogas etc. This will encourage people to participate plus reduction pressure on forest and illegal crimes.
- Support integration with SMART patrolling technologies.

B. Establishing compensation and insurance schemes	NATIONAL LEVEL	GEWOG LEVEL
1. Conduct a national consultation and review of strengths and weaknesses of existing insurance and compensation schemes. Use review to inform design of applicable new schemes. 1st year.		
2. Develop national policy for insurance schemes for livestock and crops. One which covers all crops and against all livestock losses. Use recommendations from the Review to inform policy. 1st – 2nd Year.		
3. Develop national policy for ex gratia payment in the event of loss of human life, or injury. Use recommendations from the Review to inform policy. 1st – 2nd Year.		
4. Develop private sector partnerships (e.g. RICB, Bhutan Insurance and banks) for effective design and delivery of insurance scheme for HWC. 1st – 2nd Year.		
5. Conduct training for officials on insurance and compensation schemes. 1st – 2nd Year.		
6. Raise local awareness on compensation and insurance schemes and ensure they are integrated with reporting mechanisms, hotspot mapping, and HWC information systems. 1st – 2nd Year.		
7. Pilot crop and livestock insurance across 9 Gewogs.		

Critical design features

- National review should include review of premiums, government subsidies for membership, amount of seed funds, compensation amounts and rates, and current compensation scheme with WCD etc.
- Insurance and compensation schemes must apply to all crops, and include all predators and all livestock breeds, and human injury or death.
- Explore options that are financially sustainable.

C. Enhancing informant networks	NATIONAL LEVEL	GEWOG LEVEL
1. Conduct a gap analysis at Gewog level to determine needs for enhancing informant networks locally. 1st year.		
2. Using recommendations of the Gap Analysis to fill resource and technical gaps locally. 1st-2nd year.		
3. Conduct feasibility with telecommunications companies for the establishment of an anonymous hotline for informants. 1st year.		

Critical design features

- Incentivize people to participate in informant networks.
- Increase salaries of resoops at par with ESP (Nu. 7000.00) per month. If possible, recruit them in ESP category. Use CF members wherever possible.
- Increase number of resoops from 2 to 3 per Gewog.

D. Developing alternative livelihoods and income diversification programs	NATIONAL LEVEL	GEWOG LEVEL
1. Collaborate with local authorities and existing national programs to develop Goeg level projects to reduce reliance on natural resources from both inside and outside protected areas. 1st year.		
2. Support roll-out of projects. 2nd year.		
3. Collaborate with local authorities and existing national programs to develop Goeg level projects to develop alternative income streams and adopt livelihood activities that are not prone to HWC. 1st year.		
4. Support roll-out of projects. 2nd year.		

Critical design features

- (2) Actions to consider in projects include: biogas for fuel; monitoring of bamboo shoot extraction; solar for lighting etc,; group formation for NTFP collection; establishment of nurseries; cultivate fallow land; greenhouse; irrigation; registration of community forests; removal of cattle sheds inside protected areas; planting of trees for wood craft; rainwater harvesting; agroforestry.
- (4) Actions to consider in projects include: ecotourism and locals as guides; bamboo planting; mushroom cultivation; bee keeping; poultry and fish farming; revive traditional products; value adding to bamboo and cane.

E. Wildlife friendly livestock	NATIONAL LEVEL	GEWOG LEVEL
1. Develop and support activities locally to increase level of guarding and herding of livestock during the day, as well as tethering at night. 1st – 3rd years.		
2. Facilitate community agreement on grazing areas. Include as zones within the HWC management plan.		

Critical design features

- Include consideration for: stall feeding; free range grazing during day and return to homes at night; improved pasture development with fencing (consider both community and private pasture development); cowsheds in HWC hotspots; solar lighting around cowsheds.
- Where existing community systems are in place, these should be enhanced and supported.

F. Wildlife friendly cropping	NATIONAL LEVEL	GEWOG LEVEL
1. Enhance existing and locally applicable measures to prevent crop loss during the day, at night and at peak HWC times. 1st year – 2nd year.		

Critical design features

- Include consideration for: stone walls in wildlife passages; buffer zones around crops; mesh in HWC prone areas; bio fencing; early and warning systems.

G. Enhancing innovation for prevention	NATIONAL LEVEL	GEWOG LEVEL
1. Conduct feasibility study for the establishment of HWC innovation funds with banks, WCD, micro credit agencies and private sector (e.g. hydro power, airline companies). 1st year.		
2. Pilot innovation fund in 9 Gewogs. 2nd year.		
3. Conduct detailed mapping of existing electric fencing and proposed fencing areas. 1st year.		
4. Support strategic fencing in critical hotspot areas. 1st year.		

Critical design features

- Along with mapping fencing, include natural barriers such as cliffs, very steep slopes and large water bodies. This is to ensure a holistic understanding of all barriers across the Gewogs, and to factor in funneling affect for wildlife.
- Strategic funding must consider multiple types of fencing (electric, bio and trenches etc), with consideration given to financial sustainability of final design.

H. Establishing Response Teams	NATIONAL LEVEL	GEWOG LEVEL
1. Facilitate a national workshop bringing in international experts to develop a national plan for Response Teams. Critical outputs will include: operating protocols and decision trees, and exploration of most relevant modality for Response Teams in Bhutan. 1st year.		
2. Based on the national consultation workshop, support the development of national policy to support and give a mandate to Response Teams. 2nd year.		
3. Conduct Response Teams gap analysis across all Gewogs. This is an opportunity to dovetail resources with existing rangers and community forest groups and hotspots. 1st year.		
4. Establish Response Teams and strengthen through training. 1st – 3rd year.		
5. Design a reporting and verification protocol to be used by Response Teams. This will be integrated into SMART reporting mechanisms, information capture and analysis, hotspot mapping, education and preventative measures and insurance schemes. 1st year.		

Critical design features

- Verification protocol to be made simple and quick (for insurance and compensation).
- Response Teams to be trained in: first aid, body recovery, wildlife rescue from traps, from snares, and use of tranquilizers.
- Maintain regular visit by RNR extension staff, sharing of data and responsibility, support with adequate TA/DA, record keeping by giving facilities at community level.
- Develop system for acknowledging receipt of data and information and secure data for future reference.

I. Establishing reporting systems	NATIONAL LEVEL	GEWOG LEVEL
1. Rapid review of global conflict reporting mechanisms. Review should include discussion of how best to maximize reporting potential (e.g. free hotlines, SMS-based, smart phone plugin, linked to incentives and rapid Response Teams). 1st year.		
2. Develop a conflict reporting system. This should be standardized across Bhutan. 2nd year.		
3. Develop a Bhutan-wide HWC data / information management system. 3rd year.		
4. Test the reporting system across target Gewogs. 2nd year – 3rd year.		

Critical design features

- While reporting system is being developed in year 1, roll out the use of existing reporting mechanisms that are in place (ie. phone call, or reporting to officials in person).
- The reporting system needs to be incentivized in order to be used effectively. This can either be direct incentive to report, effective and timely payment of compensation, subsidized phone costs of calls/reporting etc.

J. Formulating HWC information systems and HWC Management plans locally	NATIONAL LEVEL	GEWOG LEVEL
1. Strengthen the national level HWC Committee to ensure adequate integration between each department. 1st year.		
2. Develop local level committees who oversee the facilitation of HWC management plans, coordinate with national committee, facilitate local participation, and who distribute regular information about HWC local events, and national guidance. 1st year.		
3. Support to Gewog level HWC committees to facilitate Gewog level HWC Management plans.		

Critical design features

- There is a need to improve coordination, (Gewog environmental conservation committee), there is no coordination amongst department, Dzongkhag and Gewog (for instance field officials are not aware of seed money, compensation).
- The HWC committee should comprise members from village, Gewog, and Dzongkhag and report up to the national committee.
- Gewog HWC committees will need support in developing, implementing and monitoring the HWC plans.
- Ensure HWC Plans are included in Gewog fiscal plans.
- Ensure that all actions and programs to be implemented across Gewogs within this Strategy are incorporated into the local HWC plans.

K. HWC education program	NATIONAL LEVEL	GEWOG LEVEL
1. Conduct research into, and develop a Bhutan-wide guide on which preventative mechanisms are most effective in which contexts. 2nd year.		
2. Develop national education manuals for local adaptation and use. 3rd year.		

Critical design features

- Create awareness, media ads (village, school) relating to laws, conservation, and environmental management.
- Study tours to protected areas both in and out country to learn from experiences.
- Involvement of religious people for awareness creation on protecting species.
- Capacity building of RNR and officials, including on livestock, agriculture, as well as conservation and ecosystem services.

6.5 Future Steps – what else could be considered

1. Explore ways to demonstrate linkages between REDD / climate mitigation schemes to offer financial inducement for wider industry adoption.

6.6 Measuring progress

ONGOING	BY MIDWAY MARK
• Number of wildlife killed in retaliation • Number of humans killed or injured • Number of wildlife crime cases recorded (involving snaring, trapping, poisoning, electrocution, hunting etc.) • Human population, density and growth • Number and cost of livestock killed or injured • Area, cost and type of crops lost or damaged • Number of reported incidents • Number of verified conflict incidents • Average time to respond to an event	• Number of insurance claims made • Number of innovation grants • Number of national policy mechanisms enacted to support HWC • Proportion of areas / landscapes / sites effectively covered by trained Response Teams • Report on each numbered action in First Steps

7 SAFE WILDLIFE

7.1 Introduction to the context

A healthy and viable population of wildlife species is paramount for healthy ecosystem on which we depend on daily basis and to nurture this ecosystem the wildlife should be safe.

A Safe wildlife is one that has no interaction with humans or their livelihoods. Wild animals however sometimes naturally put themselves at risk by needing large spaces to roam and establish new territory, by being generalists who have adapted to very diverse habitats and ecosystems, and by preferring the easy passages to move which can also have high human presence – e.g. open fields, roads and walking tracks, riparian corridors, and eco-tones. Compounding these naturally occurring risks is the rapid rise in the human population and their need for more space and natural resources, and the associated habitat loss. All these forces conspire to decrease the safety of wildlife.

A Safe wildlife is one that is protected by law with harsh associated penalties for any violation. The laws protecting the wildlife will also ensure equal protection for its habitat and prey and at the same time has a task force nearby devoted to its protection through consistent enforcement of the law. Such a task force (e.g. rangers, community, etc.) will have a legal mandate to deliver the law, remove threats, prosecute any violations, and continue to monitor and support the safety of the wildlife over the long term. So the wildlife will therefore have free and open range habitat to roam and has sufficient wild prey and food it needs.

A Safe wildlife is intented to contribute to local lives and livelihoods such as the ways in which wildlife can reinforce positive linkages through approaches such as: ecotourism, certification, wildlife premiums, green bonds, natural capital valuation and PES, biodiversity safeguards in REDD and associated climate mitigation financing. There should be a rapid Response Team that can guide it back wildlife to its habitat, remove it from danger, control crowds of people, and who can continue to educate people about wildlife and their conservation. So wildlife should continue to have the physical ability to hunt food and has access to a veterinary physician or trained specialist who can provide medical treatment and monitoring in the event of injury and disease.

7.2 Evidence – what is known (lessons from the field)

Laws, enforcement, and protected management

Healthy and viable population of wildlife require conservation support – if they can be protected their populations can readily recover. If the laws and protection mechanisms are not in place, then history shows us that their numbers can rapidly decline and become locally extinct.

Developing and enhancing domestic law for species and forest protection is challenging due to the fact that wildlife and forests relate to a diverse range of government sectors governed by a wide variety of legislative instruments. The development of domestic laws and identification of strengths and weaknesses of preventative and criminal justice systems for wildlife conservation can be supported through the use of the UNODC Wildlife and Forest Crime Analytic Toolkit, and is also a key component of WWF and TRAFFIC's Wildlife Crime Initiative.

In the short term, site-based enforcement for the protection of species is effective, and the six Pillars of the Zero Poaching Toolkit provide a practical guide to identifying and closing the various gaps. Tools such as the SMART monitoring tool, informant networks to expose and break down criminal networks, and protection audits to identify gaps and weaknesses – have all been demonstrated to contribute toward zero poaching and the safety of wildlife.

Fencing, barriers, deterrents and early warning systems

The use of fencing, barriers, deterrents and early warning systems are some control methods widely adopted to prevent the problem of wild animals from causing damage to human wellbeing. These are mostly non-lethal methods. The methods such as guarding and scaring the animals using noise repellents (banging drums, using fires) are some of the methods which are used commonly in Bhutan. Although barriers such as electric fencing became quite popular some time ago, their installation and maintenance which underpins sustainability are often determined by the availability of an adequate resources at hand.

Positive linkages to reinforce wildlife conservation

If wildlife is seen as a valuable contributor to local development and livelihoods they have a much stronger foundation on which to maintain local tolerance of them and ultimately coexist. Linking wildlife to human development and green economies can be explored in many ways at the landscape scale. There might be immediate entry points locally where a livelihood relies on wildlife or their habitat for its success, and could be supported and up-scaled (e.g. tourism ventures or locally managed resources. The landscape may also have enabling conditions that could attract funding through external mechanisms such as product certification schemes, green bonds, PES and REDD where benefits accrue to the landscape and communities to ensure the continued provision of those services.

Response Teams
Refer to Response Team section under Safe Person

7.3 Directions – what the strategy aims to achieve by 2022

- National level outcomes:
  - **Research program into crop raiding wildlife** behavior and trends designed and commissioned
- All nine Gewogs to:
  - Have operational **insurance** schemes linked to prevention
  - Have **wildlife friendly farming** strategies and programs underway
  - Have assessed and developed **projects that foster positive links** between wildlife and people
  - Have locally-based, operational **Response Teams** operational

7.4 First Steps – actions in the first three years

PROPOSED ACTIONS

A. Research into wildlife behavior	NATIONAL LEVEL	GEWOG LEVEL
1. Design and commission research into major conflict species (e.g. wild boar, deer and primates) populations, movements and behavior in hotspot areas. 1st year – 2nd year.		

Critical design features
- Pilot research in selected Gewogs and hotspots.
- Consider radio tracking research of pigs in hotspot areas. Needs to be built on previous wild pig research and projects nationally.
- Need to study carrying capacity and populations of prey-predator.

B. Building wildlife friendly farming programs	NATIONAL LEVEL	GEWOG LEVEL
1. Refer Safe Person actions E, F and G		

C. Developing the positive linkages between wildlife and communities	NATIONAL LEVEL	GEWOG LEVEL
1. Conduct surveys across each Gewog for ecotourism and payment for ecosystem services potential. 1st year.		
2. Support the role out of ecotourism and PES programs as per the initial survey. 2nd year.		

Critical design features
- Ecotourism activities could include: homestays; birding; trekking, ecotrails. It is vital here to work with national tourism authority and with tourism operators.
- A key part of this will be awareness raising for local people on the potential and limitations of ecotourism and PES.

Assumptions and risks
- That some Gewogs will not have suitable tourism sites, or facilities.

D. Establishing Response Teams	NATIONAL LEVEL	GEWOG LEVEL
1. Refer Safe Person action H		

7.5 Future Steps – what else could be considered

1. Develop a long term research program to explore carrying capacities, prey densities, animal behavior, predator/ prey relationships etc.
2. Consider how green economic mechanisms can contribute to site and landscape management, protection, law enforcement and Response Teams
3. Consider how to adopt Safe Approach for wildlife in the transboundary landscape contexts

7.6 Measuring progress

ONGOING	BY MIDWAY MARK
• Endangered species occupancy and density • Prey density • Number of endangered species killed in poaching • Number of endangered species injured through poaching attempts • Number of problem animals removed / euthanized • Number of wildlife crime cases recorded (involving snaring, trapping, poisoning, electrocution, hunting etc.) • Number of straying species outside the protected area • Number of verified conflict incidents	• Revenue accruing for site-based management through a local green economic mechanism • Cost of barriers installed • Community attitudes toward wildlife • Report on each numbered action in First Steps

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8 SAFE ASSETS

8.1 Introduction to the context

Assets include all crops, livestock and structures. Crops and structure must be protected as they are immobile, livestock (all domestic animals) will typically do what they want if left unmanaged and therefore must be controlled and managed.

Safe Assets are those that are managed through wildlife-friendly practices that ensure they do not interact nor come into contact with wildlife. Safe Livestock are only allowed to graze in designated areas stipulated through an agreed community land use and grazing plan, or within fenced areas. Safe crops are those that are guarded and protected and located with a buffer zone away from habitat areas. Safe structures are those that are not situated on elephant migratory paths, and do not house or store attractants for wildlife.

Safe Livestock are those that are herded and guarded in open areas by a person during the day, and are fenced or tethered at night. Safe crops have fencing, barriers or deterrents separating them from wildlife, and are given extra protection during peak HWC times (e.g. seasonally, at night etc.).

Safe Livestock are those that are supported with ongoing enhancement of their management. This could be through exploration of improved breeds, better pasture, and breeding regimes that increase safety through either removing an attractant or through having a deterrent effect. Safe crops are those that do not attract or are prone to conflict and are managed using new techniques and processes that serves to reduce HWC.

Safe Livestock are those that graze in open spaces and have full visibility of their surrounds and the ability for a quick escape if required. Livestock can be supported through a weed removal and management program to ensure that predators do not have cover and escape is impeded.

8.2 Evidence – what is known (lessons from the field)

Wildlife-friendly livestock

Livestock depredation is the most pervasive conflict brought on by predators overlapping with humans (Bora *et al*. 2009, Bose *et al*. 2011). The most cost effective way to reduce such losses is to ensure cattle are grazed in areas where they are less likely to be killed. Other common solutions include:

- Reducing number of livestock unattended at night when predators are typically active
- Erecting predator-proof fences around cattle enclosures / paddocks
- Restoration zoning
- Controlling and zoning of grazing areas
- Reducing overharvest
- Guarding and keeping a closer eye on livestock
- Changing breeds or types of animals owned or managed
- Reducing competition with livestock
- Avoiding conflict hotspots
- More conscientious carcass disposal
- More conscientious herding
- Stall feeding cattle
- Synchronizing breeding

Predator-friendly livestock management is therefore a combination of hard prevention (fencing, herding, guarding), resource management (grassland and habitat restoration, reduced over-grazing, improved breeds and zoning), and avoiding conflict areas. Each of these are strongly linked, and programs to optimize livestock management rely strongly on hotspot mapping and active community participation in developing agreed land use and zoning plans. Support for capital intensive measures such as fencing and introduction of new breeds will need to come from local micro-credit schemes and innovation funds.

Wildlife-friendly crops

Because crops do not move, nor actively defend themselves, barriers, buffers and deterrents must be put in place to protect them. As with livestock, preventing crop raiding will be a combination hard and softer resource and land use management solutions. Hard solutions can include walls, fencing, trenches, and early warning systems. Improved resource and crop management, plus land use planning can also be very effective softer solutions in the longer term. Options include (WWF-South Africa 2005):

- Limiting the encroachment of human settlements into wildlife areas
- Creation of secure key areas of habitat, such as routes or corridors, that will permit wildlife to move freely without disturbing crops
- Repositioning the boundaries of protected areas
- Relocation of agricultural activities out of wildlife areas
- Consolidation of human settlement patterns into agreed areas
- Securing separate water points for wildlife. The distribution of wildlife populations can be manipulated by changing the location of water points and providing salt licks at strategic sites
- Changing cropping regimes, e.g. growing crops not palatable to wildlife
- Diversify into other types of crops
- Use intercropping layouts for crops
- Changing timing of harvests
- Changes in location of crop fields, e.g. dwellings and fields
- Reduction in the size of crop fields

8.3 Directions – what the strategy aims to achieve by 2022

- National level outcomes:
  - Review of **national policy relating to new breeds** of cattle
  - National consultation to formulate a framework for **invasive weed management**
  - National consultation to formulate a framework for **active management of invasive animal species**
- All nine Gewogs to:
  - Have **wildlife friendly farming** strategies and programs underway
  - Have assessed and developed **projects that foster positive links** between wildlife and people
  - Have farmers implementing **enhanced livestock and cropping** practices
  - Have invasive **weed management plans** in place
  - Have **wild pig culling** pilot programs to replicate

8.4 First Steps – actions in the first three years

PROPOSED ACTIONS

A. Wildlife friendly livestock	NATIONAL LEVEL	GEWOG LEVEL
1. Refer Safe Person activity E		
B. Wildlife friendly cropping	**NATIONAL LEVEL**	**GEWOG LEVEL**
1. Refer Safe Person activity F		
C. Enhanced livestock practices	**NATIONAL LEVEL**	**GEWOG LEVEL**
1. Conduct review of national government policy to collect local breeds and supply jersey or improved breeds		
2. Support the delivery of seeds for new pasture development		
3. Support the development of livestock and poultry management plans		

Critical design features

- Consider: savings schemes to purchase poultry; alternative feeds for poultry; poultry and dairy group establishment; and supply of mini feed mill for poultry and livestock.
- Support mobile artificial insemination (AI) (additional staff requirement) through employing youth which requires training. These would be to reduce local breeds too.

D. Enhancing crop management and techniques	NATIONAL LEVEL	GEWOG LEVEL
1. Conduct research into crop suitability for all Gewogs. 1st year.		
2. Support distribution of quality seed and seedling of vegetables, fruit crops and cereal crops. 1st year		

Critical design features

- Explore and consider ways of cost sharing for technologies like irrigation, green houses, poly houses
- Explore rainwater harvesting technology support for vegetable production and for during water shortages

E. Managing invasive weeds	NATIONAL LEVEL	GEWOG LEVEL
1. Facilitate a national consultation to formulate a framework for invasive weed management. 1st year.		
2. Working closely with farmers, conduct a comprehensive survey across all Gewogs of weeds presence, mapping and distribution. 1st year.		
3. Use survey results to inform community education, and the formulation of Gewog weed management plans. 2nd year.		

Critical design features

- Explore and consider potential economic, medicinal or composting benefits of weeds and local campaigns for uprooting
- Build on any previous projects / research already implemented re weed management

F. Managing invasive animal species	NATIONAL LEVEL	GEWOG LEVEL
1. Facilitate a national consultation to formulate a framework for active management of invasive animal species (e.g. wild pigs). 1st year.		
2. Explore pilot sites for culling of wild pigs in hotspot areas. 2nd year.		

Critical design features

- Consider change to wild boar culling in forest policy to kill beyond 200m
- Consider sterilization and identification of sterilized animal through marking/ear tag/radio collaring

8.5 Future Steps – what else could be considered

1. Consider how weed management and harvesting could be linked into green economy mechanisms (e.g. weeds as biofuel).

8.6 Measuring progress

ONGOING	BY MIDWAY MARK
• Number, location and cost of livestock killed or injured p/month; p/year • Number, location and cost of incidents of crop raiding p/month; p/year • Number, location and cost of incidents of structures damaged / destroyed p/month; p/year • Number & location of humans killed or injured p/month; p/year • Statistics of crop loss • Frequency of crop raiding times/month • Severity of crop raiding cost $/month • Timing of crop raiding month and time of day • Location of crops lost next to PA/inside PA/inside village • Costs of hospitalization • Compensation $ disbursed /month /year • Membership of insurance program number/ members • Number of livestock • Livestock density • Livestock killed inside protected area • Livestock killed outside protected area • Livestock killed at night • Livestock killed during the day • Livestock killed while being herded / guarded • Livestock predation rate number/year/month • Livestock carcasses poisoned for predator killing • Revenue accruing for site-based management through a local green economic mechanism	• Revenue accruing for site-based management through a local green economic mechanism • Report on each numbered action in First Steps

9 SAFE HABITAT

9.1 Introduction to the context

Protecting habitats goes to the heart of one of the drivers of conflict – habitat loss. Any conflict management system must value habitat protection as highly as human safety, and to make it explicit and include actions to protect this wildlife domain. If people have safe areas to undertake their lives, then wild spaces and habitat are the safe domain of wildlife, and the protection of these reduce the likelihood for wildlife to stray into human dominated areas and settlements.

A Safe Habitat is one that is allowed enough space to foster ecosystem health and continuation of ecological processes. It has enough space to offer large range species space to roam and breed and maintain genetic diversity.

A Safe Habitat is protected in the long term from defragmentation, encroachment, clearing, selective logging, linear infrastructure and new settlements, and includes areas designated as "no-go" zones for any development due to their vulnerability to, and irreplaceability after disturbance.

A Safe Habitat is a large stable mostly contiguous space where wildlife live, interact and breed and provides sufficient buffer between human areas and wildlife.

In areas of degradation, a Safe Habitat is supported with regeneration actions and habitat enrichment activities for wildlife.

9.2 Evidence – what is known (lessons from the field)

<u>Land use and spatial planning</u>

HWC is highest in soft edge areas where wildlife and humans most overlap. It is pertinent therefore to as much as practicable separate humans and wildlife and preferably at large spatial scales. This is typically achieved through either the relocation of settlements out of wildlife areas or through land use and spatial planning. For resettlement, efforts should be made to identify other areas where incentives (rather than coercion) could be used to encourage both wildlife and people to spatially separate. Spatial planning however, provides multiple options: for better managing conflict activities (e.g. livestock grazing areas and community livelihoods zones); spatial parameters for insurance and compensation schemes to work within; and the long term spatial plans for an area that needs to prioritize and balance large development activities (e.g. transport infrastructure and extractive industries) with local livelihoods and wildlife conservation goals. If process-driven, spatial planning can also have the added benefit of facilitating consensus among stakeholders where mutually agreed solutions and long term visions can be developed.

Spatial plans work most effectively when: they are developed at the relevant jurisdictional scale. This enhances roll-out and ownership by local leaders, and increases chances of government budget allocation to support them; they are integrated into existing government, economic development and sector planning processes; and are updated on agreed time frames to accommodate change.

Zoning is used in most of the protected areas of Bhutan to delineate various areas of the protected area into specific allowable or prohibited activities within the larger area to secure habitat. The zoning is a key tool that would provide directions for not only resource management but also directing the land use development at various sites. Generally, there are three zones in place as part of spatial plan

i) **Core zone** represents the major portion of the park area and is closed for all human related activities except regulated research, monitoring programs and staff patrolling.
ii) **Multiple-use zone** is used to facilitate sustainable harvesting of timber and other forest products, regulated tourism and recreation, limited grazing, research, reforestation and habitat management. This area will not exceed 10% of the total park area.
iii) **Buffer zone** falls within a distance of 3-5 km from the park boundary. The buffer zone though does not come under the purview of park management, but park staff is mandated to patrol the buffer zone and check for human activities which may have adverse impacts on the park. Any major developments within the buffer zone will be subject to screening by park management and EIAs.

<u>Habitat protection, connectivity and encounter rates</u>

As habitats are degraded and fragmented, the chances for encounters between wild animals and people and their livestock increases. First, wild animals can avoid disturbed areas and move further into forest systems in search of more

favorable areas. Or second, roaming wild animals can utilize least cost energy pathways to roam across their territory, and in many cases these are roadways, ecotones, transmission lines, forest edges, riparian corridors, agricultural land, and plantations – any area that provides ease of movement. Habitat loss and fragmentation increases the edge of habitats, decreases habitat size and area of suitable interior, and increases the number of habitats and their isolation from each other. All of which conspire to bring wildlife, people and livestock into contact.

9.3 Directions – what the strategy aims to achieve by 2022

- National level outcomes:
  - National consultation and update of the 2010 **Land Cover Mapping** Program (LCMP)
- All nine Gewogs to:
  - Have enhanced **community forest patrols**
  - Have **alternative livelihoods and income diversification** programs in place
  - Have pilot sites for **habitat enrichment**
  - Have **spatial plans** agreed and operational

9.4 First Steps – actions in the first three years

PROPOSED ACTIONS

A. Enhancing community forest patrols	NATIONAL LEVEL	GEWOG LEVEL
1. Refer Safe Person activity A		■
B. Developing alternative livelihoods and income diversification programs	**NATIONAL LEVEL**	**GEWOG LEVEL**
1. Refer Safe Person activity D		■
C. Habitat enrichment	**NATIONAL LEVEL**	**GEWOG LEVEL**
1. Establishment of water holes, salt licks, forestry and water management pilot across all Gewogs.		■

D. Facilitate spatial plans at Gewog level	NATIONAL LEVEL	GEWOG LEVEL
1. Facilitate national consultation for the update of the 2010 LCMP. 1st year.	■	
2. Design and deliver spatial planning processes for each Gewog. 1st – 2nd year.		■

<u>Critical design features</u>

- Need training on the use of GPS and GIS for data collection and management with the equipment support, including livestock and agriculture
- Will require data on species and habitat suitability, economic trends, and all biophysical data relating to each Gewog.

9.5 Future Steps – what else could be considered

1. Consider how to access climate change mitigation funds (e.g. REDD and carbon credits) in support of habitat protection that can benefit communities.
2. Consider community-based wildlife tourism in support of habitat protection.

9.6 Measuring progress

ONGOING	BY MIDWAY MARK
• Area of natural habitat • Number of natural habitat patches • Edge distance of natural habitat patches • Number of perforations in habitat • Rate of natural forest loss/gain • Distribution and coverage of invasive species • Area converted from natural habitat to human use • Number of salt licks and water bodies in natural areas under improved management • Number and frequency of incidents involving illegal forest clearing • Reports from community patrols (coverage, intensity, arrests etc)	• Spatial plans completed and approved • Report on each numbered action in First Steps

10 EFFECTIVE MONITORING AND EVALUATION

10.1 Introduction to the context

Monitoring is a cornerstone of effective HWC management. Any HWC management program must be able to determine if it is achieving desired results and goals. Without comprehensive monitoring programs in place, managers are unable to direct HWC resources to the right locations, cannot advise communities on lessons and most effective preventative measures, are unable to capture and analyze HWC data, are unable to support and build on understanding the conflict profile locally, are unable to understand local people's tolerance levels with wildlife, and are unable to report to government and inform policy dialogues. As with each of the six Conflict Elements, if HWC monitoring does not exist in the management system, then the entire HWC management program is compromised.

10.2 Evidence – what is known (lessons from the field)

There is a lack of comprehensive HWC monitoring frameworks globally. This is due largely to the small project-based approaches to HWC (refer section 5.1) that have been implemented up till now, furthermore, as the SAFE systems approach represents a paradigm shift toward holistic management of HWC, there is no precedent integrated monitoring system to replicate. However as is exemplified in Bhutan, there is often a lot of data collected on HWC but it is either difficult to access (or there is no HWC authority to collate it), is spread among multiple agencies (i.e. human deaths recorded by police, livestock death data kept by agriculture/husbandry, crop loss with agriculture department etc.) who do not necessarily regard it within their jurisdiction as HWC. The key to developing effective monitoring systems in this regard is to build a framework that supports the continuation of existing data collection approaches, the enhancement of data that is collected, the broadening of the area covered by data collection, and the capture of data at a central HWC platform or database. Here it can then be used to support all the other Conflict Elements and continually support adaptive improvement and safety of the system at the site level.

The Monitoring and Evaluation framework for this strategy will be built on all the progress monitoring indicators listed in each Safe Outcome above. The important thing is there is also the feedback to the Rapid Assessment as each of these indicators are also determine the measure for effectiveness of each criteria assessed in the Rapid Assessment.

The monitoring framework will measure against three overarching impact goals:

1. Decreased incidence, frequency, severity and intensity of incidents[5];
2. Increased or maintenance of community tolerance; and
3. Decreased incidence of retaliatory wildlife killing.

Table 7: *Monitoring indicators.*

PEOPLE	• Number of wildlife killed in retaliation • Number of humans killed or injured • Number of wildlife crime cases recorded (involving snaring, trapping, poisoning, electrocution, hunting etc.) • Human population, density and growth • Number and cost of livestock killed or injured • Area, cost and type of crops lost or damaged • Number of reported incidents • Number of verified conflict incidents • Average time to respond to an event • Number of insurance claims made • Number of innovation grants • Number of national policy mechanisms enacted to support HWC • Proportion of areas / landscapes / sites effectively covered by trained Response Teams
WILDLIFE	• Endangered species occupancy and density • Prey density • Number of endangered species killed in poaching • Number of endangered species injured through poaching attempts • Number of problem animals removed / euthanized • Number of wildlife crime cases recorded (involving snaring, trapping, poisoning, electrocution, hunting etc.) • Number of straying species outside the protected area • Number of verified conflict incidents • By midway mark (end 2019) • Revenue accruing for site-based management through a local green economic mechanism • Cost of barriers installed • Community attitudes toward wildlife
ASSETS	• Number of wildlife killed in retaliation • Number of humans killed or injured • Number of wildlife crime cases recorded (involving snaring, trapping, poisoning, electrocution, hunting etc.) • Human population, density and growth • Number and cost of livestock killed or injured • Area, cost and type of crops lost or damaged • Number of reported incidents • Number of verified conflict incidents • Average time to respond to an event • Number of insurance claims made • Number of innovation grants • Number of national policy mechanisms enacted to support HWC • Proportion of areas / landscapes / sites effectively covered by trained Response Teams
HABITAT	• Area of natural habitat • Number of natural habitat patches • Edge distance of natural habitat patches • Rate of forest loss/gain • Distribution and coverage of invasive species • Area converted from natural habitat to human use • Number of salt licks and water bodies in natural areas under improved management • Number and frequency of incidents involving illegal forest clearing • Reports from community patrols (coverage, intensity, arrests etc) • Spatial plans completed and approved

10.3 Directions – what the strategy aims to achieve by 2023

- National level outcomes:
  - Establishment of a national **HWC database**
  - Establishment of a national **HWC monitoring framework**
- All nine Gewogs to:
  - Have **hotspot maps** informing farmers and decision makers
  - Have annual **impact and severity monitoring** procedures in place
  - Have annual **community attitude** surveys in place

10.4 First Steps – actions in the first three years

PROPOSED ACTIONS

A. National HWC monitoring program established	NATIONAL LEVEL	GEWOG LEVEL
1. Facilitate national consultation to design and develop a national HWC monitoring and evaluation framework and database. 1st year.		
2. Agreement and completion of M&E indicators for the Safe Strategy.		
3. Roll-out HWC monitoring framework and pilot across all Gewogs. 1st- 2nd year.		

<u>Critical design features</u>

- National consultation should include experts in the field of HWC monitoring, mapping, database management etc.
- M&E indicators will already be mostly known at the inception of this Strategy, however these can be built on through this consultation process.
- National framework must be mirrored at all Gewogs and Dzongkhag levels with agreed and periodic reporting timeframes.
- Will involve some training in M&E at all levels, as well as some provision of equipment to capture and store data.

[5] *Incidence – number of times; Frequency – how often; Severity – financial cost; Intensity – loss per event.*

B. Hotspot mapping	NATIONAL LEVEL	GEWOG LEVEL
1. As part of the national consultation workshop [Activity A], identify technical needs, and standardized design for HWC hotspot mapping, modeling, and reporting back to site level. 1st year.		
2. Begin roll out of hotspot mapping based on collection of comprehensive HWC data from Gewogs. 1st – 2nd year.		

Critical design features

- Will require some equipment provision at local level (eg GPS and computers as required), training in mapping, GPS etc and may require a nationally based GIS person devoted to this activity. This position could support the National HWC Technical Committee.
- The hotspot mapping must be strongly linked to the reporting mechanism, and the Response Teams who collect the data.

C. Impact and severity monitoring	NATIONAL LEVEL	GEWOG LEVEL
1. As part of the national consultation workshop [Activity A], identify technical needs, and standardized design for HWC impact and severity monitoring and reporting up to national level. 1st year.		
2. Begin roll out of impact monitoring based on collection of comprehensive HWC data from Gewogs. 1st – 2nd year.		

Critical design features

- Survey needs to be conducted annually and must include socio-economic data, trends, financial and human costs of HWC relative to other local challenges.

D. Community attitudes surveying	NATIONAL LEVEL	GEWOG LEVEL
1. As part of the national consultation workshop [Activity A], identify technical needs, and standardized design for community attitudes and tolerance surveying and reporting up to national level. 1st year.		
2. Begin roll out of impact monitoring based on collection of comprehensive HWC data from Gewogs. 1st – 2nd year.		

Critical design features

- Survey needs to be conducted annually and must be a simple and replicable community surveying methodology to quickly capture community tolerance to wildlife.

10.5 Future Steps – what else could be considered

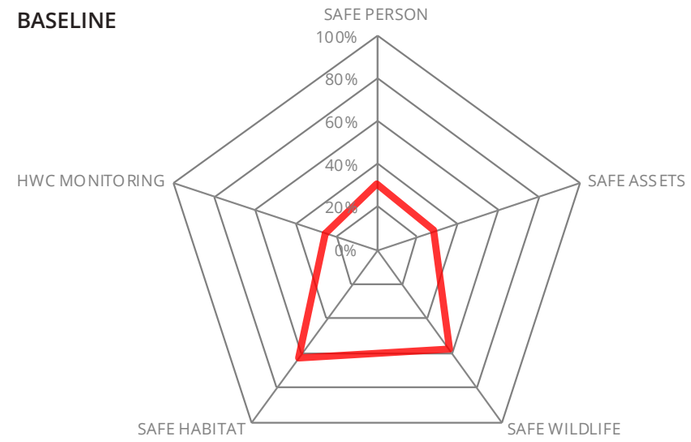
1. Consider connecting and integrating the monitoring system with SMART.

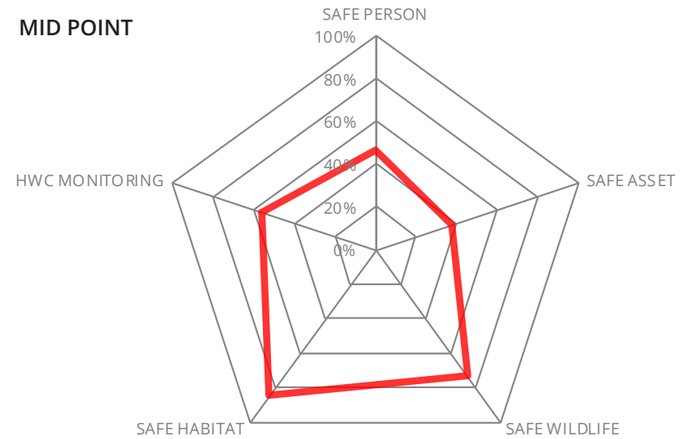
10.6 Measuring progress

ONGOING	BY MIDWAY MARK
• HWC reports submitted to national level • HWC maps, impact reports, and community attitudes reports produced after 1st year • Annual Rapid Assessment reports	• National HWC database operational • Report on each numbered action in First Steps

11 RESULTS FRAMEWORK

Due to the fact that the Safe System approach is an integrated structured system that builds on a baseline, we are able to plan for annual achievements and impacts based on the actions within the Strategy.





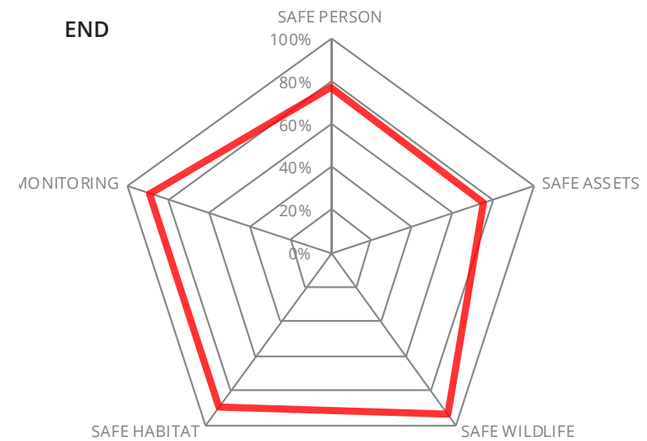


Figure 33: *Expected progress against the SAFE Baseline as a result of HWC Strategy implementation.*

The phasing of results shows how the safety of the system will gradually improve as each of the Strategic Outcomes are increasingly met. We can also demonstrate how the HWC management actions are increasingly integrated across all 6 Conflict Elements. The activities in the first two years as demonstrated in the strategies are largely foundational. This means that there are various national level consultations, and frameworks that must be developed first before rolling out at the Gewog level and nationally. This is demonstrated in the phasing results of the Six Conflict Elements where there is an initial period of small gains, but after year 5 the integration of actions is very comprehensive.

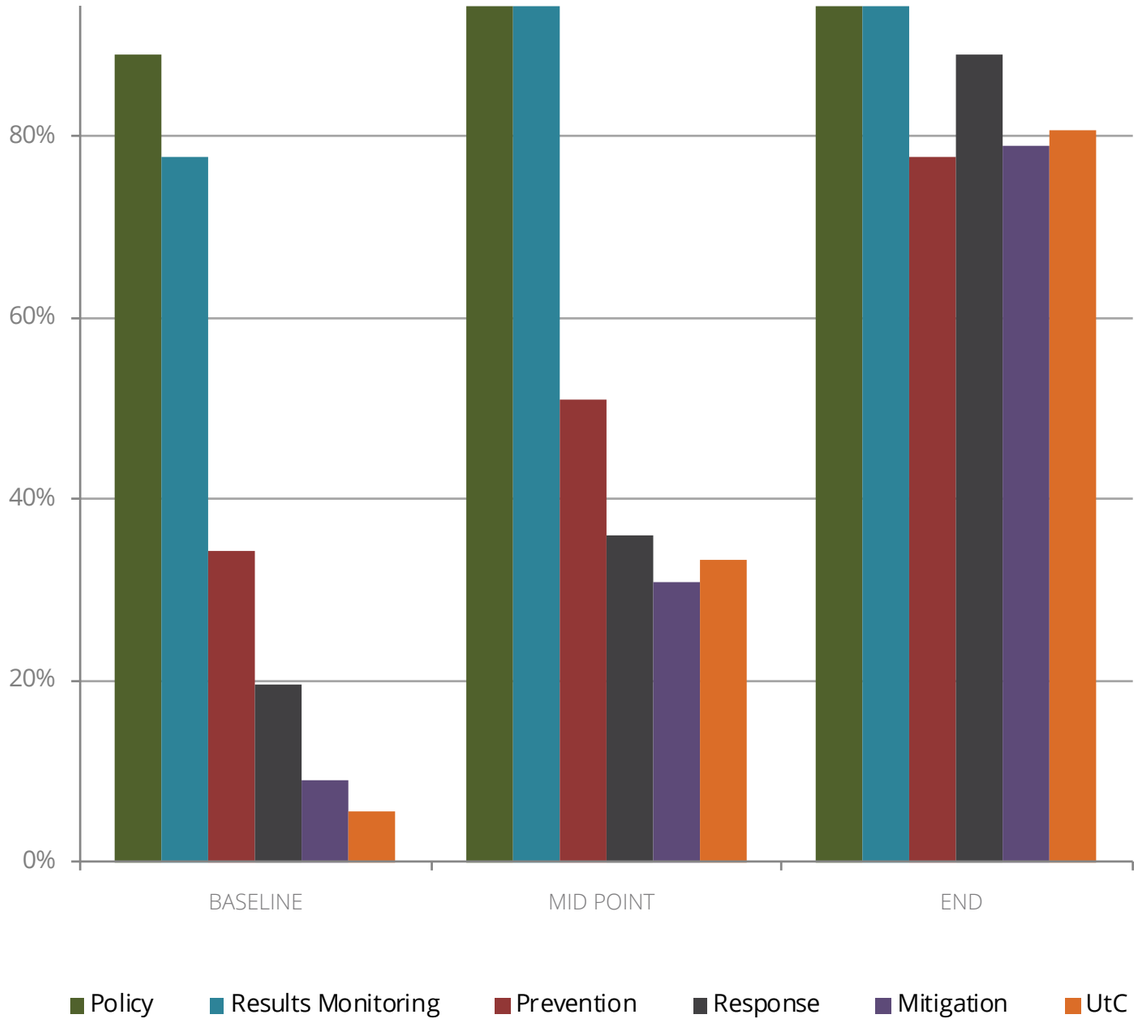


Figure 34: *Phasing of results per Conflict Element.*

Table 8: *Implementation plan for the Strategy.*

National level action	
Gewog / site level action	

SAFE PERSON PROPOSED ACTIONS	END Y1	END Y2	END Y3	END Y4	END Y5
A. Enhancing community forest patrols					
1. Gap analysis of current coverage, intensity and training needs for community patrols in 9 Gewogs. 1st year.					
2. Support filling of resource and technical gaps for community forest patrols identified in gap analysis. 1st year.					
3. Integrate patrol plans in community forests with patrols in adjacent protected areas. 2nd year.					
B. Establishing compensation and insurance schemes					
1. Conduct a national consultation and review of strengths and weaknesses of existing insurance and compensation schemes. Use review to inform design of applicable new schemes. 1st year.					
2. Develop national policy for insurance schemes for livestock and crops. One which covers all crops and against all livestock losses. Use recommendations from the Review to inform policy. 1st – 2nd Year.					
3. Develop national policy for ex gratia payment in the event of loss of human life, or injury. Use recommendations from the Review to inform policy. 1st – 2nd Year.					
4. Develop private sector partnerships (e.g. RICB, Bhutan Insurance and banks) for effective design and delivery of insurance scheme for HWC. 1st – 2nd Year.					
5. Conduct training for officials on insurance and compensation schemes. 1st – 2nd Year.					
6. Raise local awareness on compensation and insurance schemes and ensure they are integrated with reporting mechanisms, hotspot mapping, and HWC information systems. 1st – 2nd Year.					
7. Pilot crop and livestock insurance across 9 Gewogs.					
C. Enhancing informant networks					
1. Conduct a gap analysis at Gewog level to determine needs for enhancing informant networks locally. 1st year.					
2. Using recommendations of the Gap Analysis to fill resource and technical gaps locally. 1st-2nd year.					
3. Conduct feasibility with telecommunications companies for the establishment of an anonymous hotline for informants. 1st year.					
D. Developing alternative livelihoods and income diversification programs					
1. Collaborate with local authorities and existing national programs to develop Gewog level projects to reduce reliance on natural resources from both inside and outside protected areas. 1st year.					
2. Support roll-out of projects. 2nd year.					
3. Collaborate with local authorities and existing national programs to develop Gewog level projects to develop alternative income streams and adopt livelihood activities that are not prone to HWC. 1st year.					
4. Support roll-out of projects. 2nd year.					

E.	**Wildlife friendly livestock**					
1.	Develop and support activities locally to increase level of guarding and herding of livestock during the day, as well as tethering at night. 1st – 3rd years.					
2.	Facilitate community agreement on grazing areas. Include as zones within the HWC management plan.					
F.	**Wildlife friendly cropping**					
1.	Enhance existing and locally applicable measures to prevent crop loss during the day, at night and at peak HWC times. 1st year – 2nd year.					
G.	**Enhancing innovation for prevention**					
1.	Conduct feasibility study for the establishment of HWC innovation funds with banks, WCD, micro credit agencies and private sector (e.g. hydro power, airline companies). 1st year.					
2.	Pilot innovation fund in 9 Gewogs. 2nd year.					
3.	Conduct detailed mapping of existing electric fencing and proposed fencing areas. 1st year.					
4.	Support strategic fencing in critical hotspot areas. 1st year.					
H.	**Establishing Response Teams**					
1.	Facilitate a national workshop bringing in international experts to develop a national plan for Response Teams. Critical outputs will include: operating protocols and decision trees, and exploration of most relevant modality for Response Teams in Bhutan. 1st year.					
2.	Based on the national consultation workshop, support the development of national policy to support and give a mandate to Response Teams. 2nd year.					
3.	Conduct Response Teams gap analysis across all Gewogs. This is an opportunity to dovetail resources with existing rangers and community forest groups and hotspots. 1st year.					
4.	Establish Response Teams and strengthen through training. 1st – 3rd year.					
5.	Design a reporting and verification protocol to be used by Response Teams. This will be integrated into SMART reporting mechanisms, information capture and analysis, hotspot mapping, education and preventative measures and insurance schemes. 1st year.					
I.	**Establishing reporting systems**					
1.	Rapid review of global conflict reporting mechanisms. Review should include discussion of how best to maximize reporting potential (e.g. free hotlines, SMS-based, smart phone plugin, linked to incentives and rapid Response Teams). 1st year.					
2.	Develop a conflict reporting system. This should be standardized across Bhutan. 2nd year.					
3.	Develop a Bhutan-wide HWC data / information management system. 3rd year.					
4.	Test the reporting system across target Gewogs. 2nd year – 3rd year.					
J.	**Formulating HWC information systems and HWC Management plans locally**					
1.	Strengthen the national level HWC Committee to ensure adequate integration between each department. 1st year.					
2.	Develop local level committees who oversee the facilitation of HWC management plans, coordinate with national committee, facilitate local participation, and who distribute regular information about HWC local events, and national guidance. 1st year.					

3.	Support to Gewog level HWC committees to facilitate Gewog level HWC Management plans.					
K.	**HWC education program**					
1.	Conduct research into, and develop a Bhutan-wide guide on which preventative mechanisms are most effective in which contexts. 2nd year.					
2.	Develop national education manuals for local adaptation and use. 3rd year.					
	SAFE WILDLIFE PROPOSED ACTIONS	END Y1	END Y2	END Y3	END Y4	END Y5
L.	**Research into wildlife behavior**					
1.	Design and commission research into major conflict species (e.g. wild boar, deer and primates) populations, movements and behavior in hotspot areas. 1st year – 2nd year.					
M.	**Building wildlife friendly farming programs**					
1.	[Refer Safe Person actions E, F and G]					
N.	**Developing the positive linkages between wildlife and communities**					
1.	Conduct surveys across each Gewog for ecotourism and payment for ecosystem services potential. 1st year.					
2.	Support the role out of ecotourism and PES programs as per the initial survey. 2nd year.					
O.	**Establishing Response Teams**					
1.	[Refer Safe Person action H]					
	SAFE ASSETS PROPOSED ACTIONS	END Y1	END Y2	END Y3	END Y4	END Y5
P.	**Wildlife friendly livestock**					
1.	[Refer Safe Person activity E]					
Q.	**Wildlife friendly cropping**					
1.	[Refer Safe Person activity F]					
R.	**Enhanced livestock practices**					
1.	Conduct review of national government policy to collect local breeds and supply jersey or improved breeds.					
2.	Support the delivery of seeds for new pasture development.					
3.	Support the development of livestock and poultry management plans.					
S.	**Enhancing crop management and techniques**					
1.	Conduct research into crop suitability for all Gewogs. 1st year.					
2.	Support distribution of quality seed and seedling of vegetables, fruit crops and cereal crops. 1st year.					
T.	**Managing invasive weeds**					
3.	Facilitate a national consultation to formulate a framework for invasive weed management. 1st year.					
4.	Working closely with farmers, conduct a comprehensive survey across all Gewogs of weeds presence, mapping and distribution. 1st year.					
5.	Use survey results to inform community education, and the formulation of Gewog weed management plans. 2nd year.					
U.	**Managing invasive animal species**					
1.	Facilitate a national consultation to formulate a framework for active management of invasive animal species (e.g. wild pigs). 1st year.					

2. Explore pilot sites for culling of wild pigs in hotspot areas. 2nd year.					
SAFE HABITAT PROPOSED ACTIONS	END Y1	END Y2	END Y3	END Y4	END Y5
V. Enhancing community forest patrols					
1. [Refer Safe Person activity A]					
W. Developing alternative livelihoods and income diversification programs					
1. [Refer Safe Person activity D]					
X. Habitat enrichment					
1. Establishment of water holes, salt licks, forestry and water management pilot across all Gewogs.					
Y. Facilitate spatial plans at Gewog level					
1. Facilitate national consultation for the update of the 2010 LCMP. 1st year.					
2. Design and deliver spatial planning processes for each Gewog. 1st – 2nd year.					
HWC MONITORING PROPOSED ACTIONS	END Y1	END Y2	END Y3	END Y4	END Y5
Z. National HWC monitoring program established					
1. Facilitate national consultation to design and develop a national HWC monitoring and evaluation framework and database. 1st year.					
2. Agreement and completion of M&E indicators for the Safe Strategy.					
3. Roll-out HWC monitoring framework and pilot across all Gewogs. 1st- 2nd year.					
AA. Hotspot mapping					
1. As part of the national consultation workshop [Activity A], identify technical needs, and standardized design for HWC hotspot mapping, modeling, and reporting back to site level. 1st year.					
2. Begin roll out of hotspot mapping based on collection of comprehensive HWC data from Gewogs. 1st – 2nd year.					
AB. Impact and severity monitoring					
1. As part of the national consultation workshop [Activity A], identify technical needs, and standardized design for HWC impact and severity monitoring and reporting up to national level. 1st year.					
2. Begin roll out of impact monitoring based on collection of comprehensive HWC data from Gewogs. 1st – 2nd year.					
AC. Community attitudes surveying					
1. As part of the national consultation workshop [Activity A], identify technical needs, and standardized design for community attitudes and tolerance surveying and reporting up to national level. 1st year.					
2. Begin roll out of impact monitoring based on collection of comprehensive HWC data from Gewogs. 1st – 2nd year.					

12 DELIVERING THE STRATEGY

12.1 Management Arrangement

The Ministry of Agriculture and Forests will execute the project. The National Plant Protection Centre under the Department of Agriculture, Ministry of Agriculture and Forests (MoAF) will coordinate the implementation of project with all the implementing agencies proposed below:

- Wildlife Conservation Division
- Department of Livestock
- Forest Territorial Divisions
- Dzongkhag Administrations – Wangdue, Trongsa, Zhemgang, Mongar
- Local government
- Local groups and cooperatives
- Civil Society Organizations
- Non-governmental organizations
- Schools
- Tourism
- Monastic bodies
- WWF Bhutan

A **Project Steering Committee (PSC)** will be established by the MoAF by the executive order to provide high-level guidance and oversight of the project. The PSC will be chaired by the Honorable Minister of the MoAF with members from the head of the department, including GNHC, donors. The Program Director of the NPPC will serve as a Secretary General of the PSC. The PSC will be responsible for high-level management decisions and policy guidance required for implementation of the project, including recommendations and approval of project plans, budget and revisions. The following will be the Terms of Reference of the PSC:

- Provide overall guidance and oversight on project implementation activities;
- Approve all major project initiatives and strategic issues;
- Facilitate project work within each member's respective institution;
- Annually review and assess the progress of the Project and its components;
- Annually review and approve the work plan and updated budgets of the Project and its activities;
- Act as a primary lobbying and coordinating body to ensure Royal Government of Bhutan's policy, legislative, and financial support for the Project;
- Act as a liaison between the Project and other national and international programs, organizations and donors;
- Support the cross-sectoral approach of the Project by creating mechanisms for interaction with NGOs and other stakeholders; and
- Continue to seek additional funding to support the outputs and activities of the Project beyond the lifespan of donors funding

Technical Advisory Group consisting of multi-disciplinary team from various government agencies and implementing partners, including WWF Bhutan, will be formed to provide technical advice and support to the project. The key tasks of this group will be to: ensure the technical soundness of the planned activities especially with regards to environmental sustainability and conservation needs; ensure technical coordination between various implementing agencies where such coordination is critical and opportunities of synergy exist; provide guidance and backstopping where technical issues are confronted; and ensure that the project activities are carried out in accordance with existing policy/technical standards and norms including those pertaining to social and environmental standards. The Technical Advisory Group will be held every six months and chaired by the Head of the Division of the Department of Agriculture.

Project Management Unit: Under the oversight and guidance of the Head (Program Director) of the National Plant Protection Centre, the Project Management Unit (PMU) will be responsible for day-to-day project management, including monitoring and evaluation, and coordination with the various responsible parties for planning and implementation of the activities for the delivery of project results in a timely and effective manner and as per the donor standards. It is envisaged that the Project Management Unit will be required to be staffed with a project manager, a monitoring and evaluation officer, a project assistant, and a project accountant on a full-time basis through project funds given the complexity and management challenges that an integrated project such as this presents. The Terms of Reference of PMU is suggested as follows:

- Day-to-day management of project
- Ensure that the project produces the deliverables specified in the project document, to the required standard of quality and within the specified constraints of time and budget
- Set up project teams if required
- Administration and financial support for the project
- Interaction with national partner/donors on implementation
- Provide technical assistance for other projects as needed
- Leading joint activities across the projects
- Formulate pipeline ideas

12.2 Delivering the Strategy

The strategies will be delivered through the Outcomes identified below.

NATIONAL LEVEL	
OUTCOMES	**PROPOSED IMPLEMENTING AGENCY**
• Policy on insurance and compensation schemes	• Policy and Planning Division, DoA, DoFPs
• Develop national policy on ex gratia payment	• DoA, NPPC, DoFPs
• Establishment of HWC Innovative Funds with banks, WCD, microcredit agencies and private sector	• DoA, DoFPs, NPPC
• National policy and mandate for Response Teams	• DoA, DoFPs
• Accepted national Response Teams – Decision Trees and Operating procedures	• DoA, DoFPs, DoL, NPPC
• Establishment of national reporting mechanism	• NPPC
• Establishment of national HWC database	• NPPC
• Establishment of national HWC committee	• DoA, NPPC
GEWOG LEVELS	
OUTCOMES	**IMPLEMENTING AGENCY**
• Alternative livelihoods programs are in place and ongoing	• DoA, DoFPs, DoL
• Have operational scheme linked to preventions	• NPPC
• Informant networks are in place and functioning	• Nine Gewogs
• Wildlife friendly farming and strategies are in place	• NPPC
• Have access to funds for support prevention and innovation	• DoA, DoFPs
• Have an operating and highly utilized conflict reporting system	• NPPC
• Have locally-based, operational Response Teams	• Nine Gewogs
• Have conflict information systems readily accessed by local communities	• NPPC
• Have HWC management plans developed and implemented	• DoA, DoFPs, DoL, NPPC
• Have community education manuals and resources developed and updated	• NPPC, Nine Gewogs

12.3 Technical Support and Partnerships

A number of central government agencies and civil society organizations will have a key role in providing technical guidance and collaboration to the responsible parties for lead implementation. These agencies include:

- Department of Agricultural Marketing and Cooperatives, MoAF – The marketing department will provide technical support and guidance for improving value chains and marketing of RNR products and for development of community-based groups and cooperatives to support local livelihoods.
- Tarayana Foundation – Since it is the CSO dedicated to socio-economic improvement of the poor and marginalized communities, they will potentially play a key role in terms of social mobilization and outreach to local communities for improved livelihood especially among the poor and disadvantaged groups in the project landscapes.
- Royal Society for Protection of Nature, a Bhutanese CSO dedicated to nature conservation, we will have potentially a key role in terms of raising community awareness and understanding of environmentally sustainable livelihoods and innovative approaches to integrating conservation and local livelihoods.
- Monastic communities – Bhutan is largely a Buddhist country and peoples believe and faith in Buddhism is very strong. People readily listen to religious leaders and integrating conservation with the religion will have high impact to communities. During project activities, involving religious communities will have positive outcome.
- Schools – creating awareness in the schools on the importance of conservation and involving students in conservation activities like bird watching, plants identification, excursions, biking, etc.
- Tourism – promoting local tourism through building eco-lodges, local cultures and traditions, homestays, eco-trails, eco-tourism and agro-tourism to provide cash income to local communities will divert local communities from depending on natural resources and reduce interaction with wildlife.
- WWF - As a parent organization of the Safe System Approach, WWF will provide technical support in implementation of the strategies and in roll out of the approach. In addition, WWF will provide financial support and is responsible for monitoring and evaluation.

13 APPENDICES

Appendix 1: HWC Rapid Assessment questions and criteria.

STRATEGIC OUTCOMES	STRATEGIC INTENT	#	CRITERIA	EFFECTIVENESS	ELEMENT
Safe Person	Do not hunt wildlife	1	What proportion of area do the law protecting species cover?	1: Laws are by personal agreement only with no means to be enforced; 2: Laws are in place and with minimal physical, financial and human resources for effectiveness enforcement and punishment, and are generally known by affected people 3: Laws are in place with less than 75% of the physical, financial and human resources needed for effective enforcement and punishment and laws are well known by affected people 4: Laws are stipulated and recognized by national government, and have extensive means to be enforced everywhere.	Policy
		2	What proportion of the site is covered by patrols?	1: Patrolling is seldom done; 2: patrolling is 0-4 days p/mth; 3: patrolling is 5-14 days p/mth; 4: patrolling is 15 days or more p/mth	Prevention
		3	What proportion of people does the law apply to?	1: forest and wildlife crime incidents are high and/or increasing; 2: steady; 3: decreasing and prosecutions are common; 4: minimal to zero forest and wildlife crime occurs.	Prevention
		4	What proportion of people does the law apply to?	1: Following arrest judicial processes ensure fair trials and prosecution in zero cases; 2: in 1-50% of cases; 3: in 50-80% of cases; 4: In 80-100% of cases.	Policy

Safe Person	Participate as partners for protection	5	What proportion of the non-Protected Area is covered by community patrols?	1: Zero participation 2: 1 – 50% of communities have people participating 3: 50 – 80 % of communities have people participating 4: 80 – 100 % of communities have people participating	Prevention
		6	What proportion of communities has the option to participate in an insurance scheme for HWC? (ie for livestock and crops)	1: Zero local participation 2: 1 – 50 % of communities have people participating 3: 50 – 80 % of communities have people participating 4: 80 – 100 % of communities have people participating	Mitigation
		7	What proportion of the area is covered by a compensation program for HWC? (i.e. for livestock and crops)	1: Zero awareness of the program exists 2: 1 – 50 % of communities are aware of the program and would use it if needed 3: 50 – 80 % 4: 80 – 100 %	Mitigation
		8	What proportion of the area does the informant network cover?	1: Zero patrols are conducted based on intelligence each month; 2: 5% of patrols are conducted based on intelligence from the informant network each month; 3: Up to 10% of patrols are conducted based on intelligence from the informant network each month; 4: More than 10% of patrols are conducted based on intelligence from the informant network each month.	Prevention
		9	What proportion of the area is covered by an anonymous or public informant network? e.g. hotline	1: Low usage and knowledge of it locally 2: Local knowledge of it and low usage 3: Good local knowledge and growing use of it and leading to seizures 4: High usage and leading to an increase in seizures or patrols	Prevention

Safe Person	Do not venture into, forage, or conduct livelihoods activities inside designated PAs	10	What proportion of people DOES NOT rely on forest resources from the Protected Area for income or subsistence?	1: Activities inside the PA have increased over time 2: Activities inside the PA have remained steady over time 3: Activities inside the PA have decreased over time 4: Activities inside the PA are minimal or non-existent	Prevention
		11	What proportion of people DOES NOT rely on forest resources from OUTSIDE the Protected Area for income?	1: 80-100% of household income comes from forest resources 2: 50-80% 3: 10-50% 4: 0-10%	Prevention
		12	What proportion of people DOES NOT rely on forest resources from OUTSIDE the Protected Area for subsistence?	1: 80-100% of household subsistence comes from forest resources 2: 50-80% 3: 10-50% 4: 0-10%	Prevention
		13	Are people safe from injury or death by wildlife?	1: Conflict resulting in human injury or death by wildlife is over 24 incidents per year 2: ... 12 -24 incidents per year 3: ... 6-12 incidents per year 4: ... 0 - 6 incidents per year	Prevention

Safe Person	Conduct wildlife-friendly farming	14	What proportion of livestock are guarded or herded during the day?	1: Number of livestock killed during the day has increased over time (6am-6pm) 2: ... has remained steady over time 3: ... has decreased over time 4: ... is almost non-existent now	Prevention
		15	What proportion of livestock are fenced / enclosed / tethered at night?	1: Number of livestock killed during the night has increased over time (6pm-6am) 2: ... has remained steady over time 3: ... has decreased over time 4: ... is almost non-existent now	Prevention
		16	What proportion of the area has agreed grazing areas?	1: 80-100% of livestock that are killed or injured are outside agreed grazing areas 2: 50-80% 3: 10-50% 4: 0-10% livestock killed or injured are outside agreed grazing areas	Prevention
		17	What proportion of crops is consistently guarded?	1: Crop loss has remained high or is increasing over time 2: ... has remained steady over time 3: ... has decreased over time 4: ... is almost non-existent now	Prevention
		18	What proportion of crops has barriers separating them from habitat?	1: 80-100% of crops raided do not have barriers 2: 50-80% 3: 10-50% 4: 0-10%	Prevention
		19	What proportion of crops is given extra protection during peak HWC times? (e.g. harvest or planting)	1: Crop loss during peak conflict times has been increasing over time 2: ... has been steady over time 3: ... has decreased over time 4: ... is now almost zero	Prevention

Safe Person	Have the means and ability to implement preventative measures	20	What proportion of the communities has the skills to put in place preventative measures?	1: People use only their existing skills knowledge 2: use mostly their existing skills but have access to some information and lessons from elsewhere using local means 3: have access to some lessons and ideas and techniques from other places using media sources and online 4: have extensive access to lessons and techniques from external sources using media, online sources, and also have access to training and workshops	Prevention
		21	What proportion of people has access to credit; micro loans; innovation funds for prevention measures?	1: People use their own money 2: People use mostly their own money and borrow from relatives or micro-credit 3: People combine their own money with micro credit loans, and have access to some grants for prevention 4: People can readily access micro credit, grants from innovations funds or from government, to put in place preventative measures	Prevention
		22	What proportion of communities has the right or ability to put in place preventative measures?	1: People are not able to make any modifications to the land at all 2: People can make only few modifications to the land 3: People can make many modifications to the land based on local agreement 4: People have complete rights over their land and can do whatever they choose on it	Prevention
Safe Person	Have access to funds to support locally applicable preventative measures	23	What proportion of preventative measures been copied locally and/or applied elsewhere?	1: Preventative measures stay just at a household or village level; 2: A few measures have been expanded within the immediate area; 3: Some measures have been replicated outside the immediate area; 4: Some measures have been given further grants and expanded locally, adopted by other villages, or adopted by government or private sector as a solution.	Prevention

Safe Person	Have safe working environments	24	What proportion of people who work outside have a plan or system in place to protect them? (e.g. early warning system)	1: Human injury or death when working in the fields or forest has increased over time 2: has remained steady over time 3: has decreased over time 4: is now minimal or zero	Prevention
Safe Person	Households have more than one income stream	25	What proportion of people participates in income diversification programs? (i.e. seeking more income streams)	1: HWC incidents negatively impact 80-100% of household incomes 2: 50-80% of household incomes 3: 10-50% of household incomes 4: 0-10% of household incomes	Mitigation
Safe Person	Household income sources are not linked to conflict	26	What proportion of people participates in programs to reduce dependence on conflict prone livelihoods?	1: 100% depends on livelihoods which are prone to HWC 2: 50-80% 3: 10-50% 4: 0-10% depend solely on livelihoods prone to HWC. They have several other income streams to fall back on	Mitigation
Safe Person	Participate in a conflict reporting mechanism	27	What proportion of the area is covered by the reporting mechanism?	1: Reports are either never made or made 1-6 mths from event 2: Reports are made 1 week-1 mth from event 3: Reports are made 1 -7 days of the event 4: Reports are made within 0 hours - 1 day of the event	Response
		28	What proportion of the area is covered by the reporting mechanism?	1: 0-33% of events are reported 2: 33-66% of events are reported 3: 66-90% of events are reported 4: 90-100% of events are reported	Response
Safe Person	Are supported by locally based Response Teams	29	What proportion of the area is covered by Response Teams?	1: Response times are over 1 week 2: 2-7 days 3: 1-2 days 4: 0-24 hours	Response
Safe Person	Has access to a conflict information system	30	What proportion of communities is involved in a HWC information system?	1: Information on conflict events and trends is disseminated to local people once a year 2: 1- 3 times per year 3: 3-12 times per year 4: More than once a month	UtC

Safe Person	Contributes to or adheres to a HWC management system / plan	31	What proportion of the area is covered by a HWC management plan?	1. There is no coordination for HWC. Individuals just do their own protection measures. 2: There is coordination within village level only 3: There is coordination between villages 4: There is coordination at the district or higher level for HWC through a plan	Policy
Safe Person	Participates in community events for conservation	32	What proportion of communities are targets of a conservation or species education program?	1. 0-33% of people in target areas participate 2: 33-66% of people in target areas participate 3: 66-90% of people in target areas participate 4: 90-100% of people in target areas participate	Prevention
Safe Person	Does not feel fearful undergoing their daily lives	33	What proportion of people are fearful of HWC overall?	1. Communities have multiple areas off limits and daily activities are increasingly curtailed due to fear 2. Communities have multiple areas off limits and daily activities are sometimes curtailed due to fear 3. Communities have a few areas off limits and daily activities are rarely curtailed due to fear 4. Communities have very few areas off limits and daily activities are never curtailed due to fear	Mitigation

Safe Wildlife	Wildlife are not hunted, and their habitat secured	34	What proportion of area do the law protecting species cover?	1: Laws are by personal agreement only with no means to be enforced; 2: Laws are in place and with minimal physical, financial and human resources for effectiveness enforcement and punishment, and are generally known by affected people 3: Laws are in place with less than 75% of the physical, financial and human resources needed for effective enforcement and punishment and laws are well known by affected people 4: Laws are stipulated and recognized by national government, and have extensive means to be enforced everywhere.	Policy
		35	What proportion of the site is covered by patrols?	1: Patrolling is seldom done; 2: patrolling is 0-4 days p/mth; 3: patrolling is 5-14 days p/mth; 4: patrolling is 15 days or more p/mth	Prevention
		36	What proportion of people does the law apply to?	1: forest and wildlife crime incidents are high and/or increasing; 2: steady; 3: decreasing and prosecutions are common; 4: minimal to zero forest and wildlife crime occurs.	Prevention
		37	What proportion of people does the law apply to?	1: Following arrest judicial processes ensure fair trials and prosecution in zero cases; 2: in 1-50% of cases; 3: in 50-80% of cases; 4: In 80-100% of cases.	Policy
Safe Wildlife	Are separated from people, livestock and crops and rarely stray into human habitation	38	What proportion of the area is covered by barriers, fencing, early warning systems and zoning?	1: Conflict events outside PA have increased over time 2: Have remained steady over time 3: Have decreased over time 4: Are minimal or almost zero	Prevention
Safe Wildlife	Provide positive contribution to human development locally	39	What proportion of people recognizes the positive linkages between conservation and livelihoods? (eg through income from ecotourism)	1: Zero livelihoods actions are linked to wildlife, habitat or services; 2: Some actions are linked to wildlife, and habitat; 3: Many actions are linked to wildlife and habitat; 4: Almost all actions are linked to wildlife and habitat conservation.	Prevention
Safe Wildlife	Are supported by locally based Response Teams	40	What proportion of the area is covered by Response Teams?	1: Response times are over 1 week 2: 2-7 days 3: 1-2 days 4: 0-24 hours	Response

Safe Wildlife	Have secure and connected habitat	41	What proportion of wildlife habitat in the area is protected by law?	1: Laws are by personal agreement only with no means to be enforced 2: Laws are in place and with minimal structure for enforcement and punishment, and are generally known by affected people 3: Laws are in place with substantial means for enforcement and punishment and well known by affected people 4: Laws are stipulated and recognized by national government, have extensive means to be enforced.	Policy
Safe Wildlife	Are no less secure as they exit the area or cross borders	42	What proportion of the area outside site has the same protections for wildlife if they stray there? (i.e. are species still protected if the leave the site?)	1: Wildlife is highly vulnerable and almost certain to come into conflict / be killed / hunted / poached if they leave the site. 2: Some individuals will come into conflict / be killed/ hunted / poached if they leave the site. 3: Few individuals will come into conflict / be killed / hunted / poached if they leave the site. 4: No individuals are likely to come into conflict nor vulnerable to be killed if they leave the site.	Policy

Safe Assets	Are wildlife-friendly	43	What proportion of livestock are guarded or herded during the day?	1: Number of livestock killed during the day has increased over time (6am-6pm) 2: ... has remained steady over time 3: ... has decreased over time 4: ... is almost non-existent now	Prevention
		44	What proportion of livestock are fenced / enclosed / tethered at night?	1: Number of livestock killed during the night has increased over time (6pm-6am) 2: ... has remained steady over time 3: ... has decreased over time 4: ... is almost non-existent now	Prevention
		45	What proportion of the area has agreed grazing areas?	1: 80-100% of livestock that are killed or injured are outside agreed grazing areas 2: 50-80% 3: 10-50% 4: 0-10% livestock killed or injured are outside agreed grazing areas	Prevention
		46	What proportion of crops is consistently guarded?	1: Crop loss has remained high or is increasing over time 2: ... has remained steady over time 3: ... has decreased over time 4: ... is almost non-existent now	Prevention
		47	What proportion of crops has barriers separating them from habitat?	1: Crop loss during peak conflict times has been increasing over time 2: ... has been steady over time 3: ... has decreased over time 4: ... is now almost zero	Prevention
Safe Assets	Enhanced farming practices are supported	48	What proportion of people use new breeds of livestock or new management approaches for them?	1: 0-20% of people adopt new approaches; 2: 20-50% people try new approaches along with usual ones; 3: 50-80% have tried and adopted new approaches; 4: 80-100% of people are using a combination of new and usual approaches.	Prevention
		49	What proportion of people are using improved management, and crops and techniques	1: 0-20% of people adopt new approaches; 2: 20-50% people try new approaches along with usual ones; 3: 50-80% have tried and adopted new approaches; 4: 80-100% of people are using a combination of new and usual approaches.	Prevention

Safe Assets	Invasive weeds are cleared or managed	50	What proportion of the area has an invasive weed management program in place?	1: is ad hoc and rarely done; 2: is planned and sometimes done; 3: is planned and done seasonally; 4: is planned, done regularly and sometimes is a source of revenue for local people	Prevention
Safe Assets	Structures are wildlife friendly	51	What proportion of physical structures is wildlife friendly? (this relates particularly to elephants)	1: Structures are increasingly damaged by wildlife; 2: Wildlife damage to structures is steady; 3: Wildlife damage to structures in decreasing; 4: Wildlife damage to structures is minimal or almost zero.	Prevention
Safe Habitat	Is protected	52	What proportion of the area is covered by laws to protect habitat?	1: Laws are by personal agreement only with no means to be enforced; 2: Laws are in place and with minimal structure for enforcement and punishment, and are generally known by affected people; 3: Laws are in place with substantial means for enforcement and punishment and well known by affected people; 4: Laws are stipulated and recognized by national government, have extensive means to be enforced.	Policy
		53	What proportion of the area is covered by patrolling, seizure and prosecution clearing, logging and encroachment?	1: Patrolling is seldom done; 2: patrolling is 0-4 days p/mth; 3: patrolling is 5-14 days p/mth; 4: patrolling is 15 days or more p/mth	Prevention
		54	What proportion of people and corporations are complying with the law?	1: Habitat loss is increased over time 2: Habitat loss has remained stable 3: Habitat loss has decreased 4: Habitat loss is almost zero	Prevention
Safe Habitat	Is represented in a Spatial Plan for the area	55	What proportion of the area is covered by a spatial or land use plan?	1: Is only at village level, or has not been accepted by relevant community or government planners and decision-makers; 2: Is at right geographic scale but has not been accepted and therefore not meaningful; 3: Is at right scale and is accepted by government and communities but not within planning or sector plans; 4: is accepted and reflected in government and sector plans.	Prevention

Safe Habitat	Is connected	56	What proportion of the area is natural habitat?	1: The site contains only small isolated patches of remnant natural habitat. 2: The site has mostly isolated patches of natural habitat, with less than 50% connected to other patches. 3: The site has mostly connected patches of natural habitat, with less than 50% isolated. 4: The site contains natural habitat that is 90-100% connected.	Prevention
HWC Monitoring	Hotspot mapping	57	Have hotspots been mapped?	1: mapped only once; 2: mapped and updated every 5-10 years; mapped and updated every 1-2 years and fed into management; 4: mapped and updated every year and fed into management decisions and actions	UtC
HWC Monitoring	Impact and severity monitoring	58	Is there a clear understanding of the human and financial cost of conflict locally?	1: surveyed only once; 2: surveyed every 5-10 years; 3: surveyed every 1-2 years; 4 surveyed and collated every year and fed into management.	UtC
HWC Monitoring	Community attitude tracking	59	Are community attitudes and tolerance to wildlife known?	Surveys conducted :1 once; 2: every 5-10 years; 3: every 1-2 years; 4: ongoing and fed into management	UtC
HWC Monitoring	Performance measurement	60	Do managers and decision makers know if their programs are achieving desired goals?	1: 0-25% decisions are based on M&E; 2. 25-50% made based on M&E; 3: 50-75%; 4: 75-100%.	Results monitoring

Appendix 2: Rapid Assessment scores for each Gewog

SAFE PERSON																											
#	RUEBISA			BJENAG			SAEPHU			TANGSIBJI			NUBI			DRAAGTENG			LANGTHIL			KENGKHAR			PHANGKHAR		
	C	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**
1	1	3	3.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0
2	1	2	2.0	1	2	2.0	0.7	3	2.1	0.65	3	2.0	0.6	3	1.8	1	3	3.0	0.8	4	3.2	1	3	3.0	1	4	4.0
3	1	3	3.0	1	2	2.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	2	2.0
4	1	2	2.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	3	3.0	1	4	4.0	1	4	4.0	1	4	4.0
5	0.2	2	0.4	0.25	2	0.5	0.2	2	0.4	0.2	4	0.8	0.6	2	1.2	0.2	2	0.4	0.25	2	0.5	0.2	2	0.4	0	0	0.0
6	1	2	2.0	1	2	2.0	1	2	2.0	0	0	0.0	1	1	1.0	1	1	1.0	1	1	1.0	1	2	2.0	1	1	1.0
7	0.7	2	1.4	1	2	2.0	0.5	2	1.0	0.6	4	2.4	0	0	0.0	0	0	0.0	0	2	0.0	0	0	0.0	1	1	1.0
8	0.5	4	2.0	0.2	2	0.4	0.2	4	0.8	1	2	2.0	1	2	2.0	1	4	4.0	0.4	4	1.6	0.2	1	0.2	0.35	4	1.4
9	1	3	3.0	1	4	4.0	0.9	3	2.7	0.5	3	1.5	1	3	3.0	1	3	3.0	0.1	3	0.3	1	3	3.0	0.15	3	0.5
10	0	0	0.0	1	4	4.0	0	1	0.0	1	3	3.0	0.8	2	1.6	0.7	3	2.1	1	3	3.0	0	0	0.0	0	1	0.0
11	0.3	3	0.9	1	2	2.0	0	1	0.0	0	4	0.0	0.2	2	0.4	0.95	4	3.8	0.5	4	2.0	0	1	0.0	0	na	na
12	0.7	4	2.8	1	2	2.0	0.25	3	0.8	0.5	3	1.5	0.5	2	1.0	0	1	0.0	0.2	4	0.8	0	1	0.0	0	0	0.0
13	0.7	4	2.8	0.9	4	3.6	0	4	0.0	1	4	4.0	0.2	4	0.8	1	4	4.0	0	4	0.0	0.9	4	3.6	0.6	4	2.4
14	0.3	1	0.3	0.5	2	1.0	0.2	2	0.4	0.3	3	0.9	0.7	1	0.7	0.8	3	2.4	0.3	2	0.6	0.7	3	2.1	0	2	0.0
15	0.9	2	1.8	0.8	2	1.6	0.8	1	0.8	0.3	3	0.9	0.9	1	0.9	0.8	3	2.4	0.8	3	2.4	1	3	3.0	0.4	2	0.8
16	0.1	1	0.1	0.8	2	1.6	0.8	4	3.2	0.5	4	2.0	0.4	2	0.8	0.5	4	2.0	0.7	4	2.8	0.1	0	0.0	0.3	4	1.2
17	0.95	1	1.0	0.7	1	0.7	1	1	1.0	0.8	1	0.8	0.8	3	2.4	1	2	2.0	0.9	2	1.8	1	1	1.0	1	2	2.0
18	0.2	1	0.2	0.8	2	1.6	1	4	4.0	1	1	1.0	0.9	4	3.6	0.5	2	1.0	0.2	2	0.4	0.9	3	2.7	0	1	0.0
19	1	1	1.0	0.8	2	1.6	1	1	1.0	1	1	1.0	0.8	1	0.8	1	3	3.0	1	2	2.0	0.6	1	0.6	1	2	2.0
20	0.6	2	1.2	0.7	3	2.1	1	3	3.0	0.3	2	0.6	1	2	2.0	0.5	2	1.0	0.8	2	1.6	1	2	2.0	1	2	2.0
21	1	3	3.0	1	4	4.0	1	3	3.0	0.4	3	1.2	0.5	3	1.5	0.15	3	0.5	1	3	3.0	1	3	3.0	0	0	0.0
22	1	4	4.0	0.7	4	2.8	1	4	4.0	0.4	2	0.8	0.7	4	2.8	0	0	0.0	0.5	2	1.0	1	4	0.0	1	4	4.0
23	1	2	2.0	0.5	2	1.0	1	4	4.0	0.2	3	0.6	0	2	0.0	0	4	0.0	0	1	0.0	0	0	0.0	1	2	2.0
24	0	4	0.0	0	4	0.0	0	4	0.0	0	3	0.0	0.6	2	1.2	0.5	3	1.5	0	4	0.0	0	0	0.0	0	4	0.0
25	0.3	1	0.3	0.3	3	0.9	0.4	1	0.4	0.25	3	0.8	0.6	2	1.2	0.3	2	0.6	0.9	3	2.7	0.55	3	1.7	0.3	1	0.3
26	0.3	1	0.3	0.3	3	0.9	0.2	2	0.4	1	3	3.0	0.4	3	1.2	0.5	3	1.5	0.3	2	0.6	0.55	2	1.1	0.1	2	0.2
27	1	3	3.0	1	1	1.0	1	1	1.0	0.9	1	0.9	1	3	3.0	0.7	1	0.7	1	2	2.0	1	2	2.0	1	4	4.0
28	1	2	2.0	1	1	1.0	1	1	1.0	0.9	1	0.9	1	3	3.0	1	1	1.0	1	1	1.0	1	3	3.0	1	1	1.0
29	1	1	1.0	1	1	1.0	0	0	0.0	1	2	2.0	0.7	2	1.4	1	1	1.0	1	3	3.0	1	1	1.0	0	0	0.0
30	0.4	1	0.4	0.2	1	0.2	0.4	1	0.4	1	3	3.0	0.5	2	1.0	0.1	1	0.1	1	1	1.0	0.7	1	0.7	0	0	0.0
31	0.05	2	0.1	0	1	0.0	0.7	4	2.8	1	4	4.0	0.6	2	1.2	0.3	2	0.6	1	4	4.0	0	0	0.0	0.3	2	0.6
32	1	1	1.0	1	2	2.0	0.7	3	2.1	1	2	2.0	0.7	3	2.1	1	3	3.0	1	3	3.0	1	4	4.0	1	3	3.0
33	1	2	2.0	1	2	2.0	1	2	2.0	0.75	2	1.5	1	2	2.0	1	2	2.0	1	3	3.0	1	2	2.0	1	2	2.0

NOTES: C: coverage; E: effectiveness; Sc: score.

SAFE WILDLIFE																										
#	RUEBISA			BJENAG			SAEPHU			TANGSIBJI			NUBI			DRAAGTENG			LANGTHIL			KENGKHAR			PHANGKHAR		
	C	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**
34	1	3	3.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0
35	1	2	2.0	1	2	2.0	0.6	3	1.8	0.65	3	2.0	0.6	3	1.8	1	3	3.0	0.8	4	3.2	1	2	2.0	1	3	3.0
36	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0
37	1	4	4.0	1	4	4.0	1	4	4.0	1	2	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0
38	0.1	1	0.1	0.5	3	1.5	1	1	1.0	0.9	3	2.7	0.6	1	0.6	1	1	1.0	0.4	2	0.8	1	1	1.0	1	1	1.0
39	0.5	1	0.5	1	3	3.0	0.4	1	0.4	0.5	3	1.5	0.6	3	1.8	0.7	2	1.4	1	4	4.0	0.7	2	1.4	0.3	2	0.6
40	1	1	1.0	1	1	1.0	0	0	0.0	1	2	2.0	0.7	2	1.4	1	1	1.0	1	3	3.0	0.7	1	0.7	0	0	0.0
41	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	3	3.0	1	4	4.0	1	3	3.0	1	4	4.0	1	4	4.0
42	1	3	3.0	1	3	3.0	1	3	3.0	0.7	3	2.1	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0	1	3	3.0

NOTES: C: coverage; E: effectiveness; Sc: score.

SAFE ASSETS																										
#	RUEBISA			BJENAG			SAEPHU			TANGSIBJI			NUBI			DRAAGTENG			LANGTHIL			KENGKHAR			PHANGKHAR		
	C	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**
43	0.3	1	0.3	0.5	2	1.0	0.2	2	0.4	0.3	3	0.9	0.7	1	0.7	0.8	2	1.6	0.3	2	0.6	0.7	3	2.1	0	2	0.0
44	0.9	2	1.8	0.8	2	1.6	0.8	1	0.8	0.3	0	0.0	0.9	1	0.9	0.8	2	1.6	0.8	3	2.4	1	3	3.0	0.4	2	0.8
45	0.1	1	0.1	0.8	2	1.6	0.8	4	3.2	0.5	4	2.0	0.4	2	0.8	0.5	3	1.5	0.7	4	2.8	0.1	0	0.0	0.3	4	1.2
46	0.95	1	1.0	0.7	1	0.7	1	1	1.0	0.8	1	0.8	0.8	3	2.4	1	3	3.0	0.9	2	1.8	1	1	1.0	1	2	2.0
47	0.2	1	0.2	0.8	2	1.6	1	4	4.0	1	1	1.0	0.9	4	3.6	0.5	1	0.5	0.2	2	0.4	0.8	1	0.8	0	1	0.0
48	0.5	2	1.0	0.6	3	1.8	0.4	3	1.2	0.4	2	0.8	1	3	3.0	0.7	2	1.4	0.3	1	0.3	0.4	2	0.8	0.4	1	0.4
49	0.7	2	1.4	0.6	2	1.2	0.5	2	1.0	0.2	1	0.2	1	2	2.0	0.8	3	2.4	0.4	2	0.8	0.3	4	1.2	0.8	3	2.4
50	0	1	0.0	0	0	0.0	0	0	0.0	1	3	3.0	0	0	0.0	0	0	0.0	0.2	2	0.4	0	0	0.0	0	0	0.0
51	1	4	4.0	1	4	4.0	1	4	4.0	0.9	4	3.6	0.7	4	2.8	1	4	4.0	1	4	4.0	1	1	1.0	0	4	0.0

NOTES: C: coverage; E: effectiveness; Sc: score.

SAFE HABITAT																									
#	RUEBISA			BJENAG			SAEPHU			TANGSIBJI			NUBI			DRAAGTENG			LANGTHIL			KENGKHAR			PHANGKHAR		
	C	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**
52	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	3	3.0	1	4	4.0	1	4	4.0
53	1	2	2.0	1	2	2.0	0.7	3	2.1	0.8	3	2.4	0.6	3	1.8	1	3	3.0	0.7	3	2.1	1	3	3.0	0.65	4	2.6
54	1	4	4.0	1	4	4.0	1	4	4.0	0.8	4	3.2	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0	1	4	4.0
55	0	0	0.0	0	0	0.0	0.5	3	1.5	1	4	4.0	0	0	0.0	0	0	0.0	1	3	3.0	0	0	0.0	1	3	3.0
56	0.96	3	4.0	0.92	3	2.8	0.97	4	3.9	0.99	4	4.0	0.97	4	3.9	0.93	3	2.8	0.98	4	3.9	0.95	4	3.8	0.99	4	4.0

HWC MONITORING																									
#	RUEBISA			BJENAG			SAEPHU			TANGSIBJI			NUBI			DRAAGTENG			LANGTHIL			KENGKHAR			PHANGKHAR		
	C	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**	**C**	**E**	**Sc**
57	0.05	1	0.1	1	1	1.0	0.5	3	1.5	0.1	1	0.1	0	0	0.0	0.7	0	0.0	0.7	1	0.7	0	0	0.0	1	0	0.0
58	1	1	1.0	1	1	1.0	1	1	1.0	1	2	2.0	0.8	4	3.2	1	1	1.0	0.3	4	1.2	0	0	0.0	1	0	0.0
59	0	0	0.0	1	1	1.0	1	0	0.0	0.7	1	0.7	0	0	0.0	0.2	1	0.2	0.5	1	0.5	0	0	0.0	1	0	0.0
60	1	4	4.0	1	4	4.0	1	4	4.0	1	3	3.0	0.5	1	0.5	1	4	4.0	0.5	2	1.0	1	4	4.0	1	3	3.0

NOTES: C: coverage; E: effectiveness; Sc: score.

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