



SAFEGUARDING WILDLIFE AND HUMAN LIFE: RANGERS AS FIRST RESPONDERS

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ABSTRACT

Rangers' role as emergency first responders is becoming increasingly important in the face of escalating climate-related natural disasters and extreme weather events. Drawing on a review of literature and data collected from surveys and focal group discussions, this study explores rangers' role as first responders in Asia. A total of 52 rangers from 12 countries were surveyed, revealing the diverse expectations, responsibilities and challenges rangers are facing. Of these, 59.6 per cent of rangers had experienced increased responsibilities during a disaster, including evacuations, rescue and recovery operations, and delivery of essential supplies like food and water. Despite their essential contributions, a majority (over 60 per cent) of rangers surveyed had not received training on first aid, flood response, emergency evacuation or disaster response. Although results varied by specific issue, overall findings indicate an urgent need for policy changes to professionalise the ranger workforce, improve training and access to resources, and establish institutional support systems for rangers. Highlighting rangers' contributions outside of conservation increases visibility of the unique value rangers add in other sectors like public health and safety.

Keywords: protected and conserved areas, natural disasters, emergency response, disaster risk reduction, essential workers, conservation

INTRODUCTION

As the body of literature on conservation rangers continues to grow, there is increased awareness of their diverse roles and responsibilities (Singh et al., 2021a). The International Ranger Federation (IRF) defines rangers as “wildlife wardens, forest guards, foresters, scouts, watchers, and other frontline staff,” responsible for protecting nature, cultural heritage, and the rights of present and future generations (Belecky et al., 2019; IRF, 2021). They represent an incredibly diverse workforce, including state employees, volunteers, local community members and Indigenous people (IRF, 2021). Recent global recognition and ongoing advocacy and research have highlighted the critical role rangers play in conservation, acting as essential workers in achieving global biodiversity targets (Appleton et al., 2022).

Despite increased visibility, rangers continue to face formidable challenges. A 2019 global survey revealed that 57.3 per cent of rangers never or rarely have access to clean drinking water on patrol, and 84.8 per cent believe

their job is dangerous due to encounters with poachers (Belecky et al., 2019). This belief is not baseless, considering 44.2 per cent of ranger deaths are due to homicide, the leading cause of on-duty ranger deaths (Belecky et al., 2019). Despite exposure to risks including zoonotic disease, dangerous wildlife encounters and poor hygiene conditions, most rangers do not have insurance for serious injury or death or are unsure of their insurance benefits (Belecky et al., 2019). More recent findings from the worldwide State of the Ranger Report show only 53 per cent of rangers have adequate health and safety training and only 38 per cent have life insurance, demonstrating the persistence of these problems (IRF, 2024). Further, just over 60 per cent of rangers believe their wages are sufficient to cover basic needs (IRF, 2024). Challenges like inadequate salaries, extended periods of time away from family, and fear of retaliation for reporting corruption can create problematic conditions conducive to misconduct such as accepting bribes or abusing human rights (Belecky et al., 2019; Woodside & Vasseleu, 2021).



Pakistani Rangers working in flood-affected areas © Jana Sindhu WWF Pakistan

To achieve the Convention on Biological Diversity's 30-by-30 target, it is estimated that the ranger workforce needs to grow by 1.2 million personnel, a 400 per cent increase (Appleton et al., 2022; IRF & URSA, 2023). Widespread workplace hazards, poor employment conditions and low earning potential for rangers are potentially detrimental to recruitment and retention (Belecky et al., 2021b). Further, in many regions, the work of rangers urgently needs government and institutional support and recognition as a profession to effectively perform the wide range of duties and responsibilities expected of them (Stolton et al., 2023). International efforts of the IRF, supported by the Universal Ranger Support Alliance (URSA) and other conservation NGOs, advocate for rangers globally, strengthening representation, sharing resources and tools, and establishing support networks to maintain the momentum generated in the last decade (URSA, 2021).

Acting as vital links between biodiversity, ecosystem services, local communities, visitors and government agencies, rangers uphold the rule of law in protected and conserved areas (PCA) worldwide. Recently, they have also led efforts in climate change mitigation, adaptation and pandemic management (Singh et al., 2021a; Stolton et al., 2023). Besides wildlife monitoring, habitat management and community outreach, it is not uncommon for rangers to lead or support emergency response efforts for extreme weather events, natural disasters or other emergencies, particularly in remote PCAs and surrounding areas (Singh et al., 2021b).

Quantifying and communicating rangers' contributions to problems outside of conservation can help address the broad lack of organisational and government agency support structures and gaps in institutional capacity.

In particular, a more comprehensive understanding of how rangers contribute towards public health and safety outcomes can provide the justification for necessary workforce expansion, professionalisation, improved working conditions, and the funding required to implement these goals (Anagnostou et al., 2022; Appleton et al., 2021; Appleton et al., 2022; Belecky et al., 2021b; Wyatt et al., 2022). Further, these improvements are essential to adequately prepare rangers to effectively respond to the increasing frequency and severity of disasters and weather-related emergencies. Efforts to highlight the full breadth and depth of rangers' contributions must continue in order to reposition rangers as a priority within global and regional policy (Stolton et al., 2023). Even with the development of a more nuanced and accurate understanding of the complex, dynamic, expanding roles of rangers in recent years, significant knowledge gaps remain.

While the prevalence of extreme weather and disasters including typhoons, droughts, floods, and wildfires continues to rise, improved warning and disaster management systems have reduced deaths and economic loss (Shivanna, 2022). These advancements, while beneficial, are not addressing the underlying problems. The World Meteorological Organization (WMO) reported

a fivefold increase in climate-related disasters over the past 50 years, with a notable surge in the last decade (WMO, 2021a; WMO, 2021b). Consequently, extreme weather and disaster resilience are an increasingly urgent priority, with widespread mitigation and adaptation measures including agroforestry, wetland restoration or carbon sequestration (McGuigan et al., 2022; Murti & Buyck, 2014; WCPA, 2023). Because of their size, biomass and biodiversity, PCAs are uniquely suited for climate change adaptation, mitigation and disaster risk reduction strategies (Hockings et al., 2020; Singh et al., 2020). Dune ecosystem protection in New Zealand, mangrove forest preservation and expansion in India, and Spekboom (*Portulacaria afra*) planting in South Africa are all adaptation strategies specifically applied within PCAs (Murti & Buyck, 2014). As PCA stewards, rangers are often essential in planning and executing adaptation, mitigation and risk reduction strategies, and serve as the first responders for the growing number of disasters and emergencies in these remote or inaccessible areas.

RANGERS' ROLE AS FIRST RESPONDERS

Emergency first responders are trained and equipped to provide immediate assistance and medical care during emergencies, natural disasters and other critical incidents (Harris et al., 2018). Traditionally recognised first responders, including paramedics, firefighters and police officers, face challenges to quickly reach remote areas or simply may not have the personnel or capacity to respond to large-scale emergencies (Jones et al., 2023; Spencer-Goodsir et al., 2022). Apart from rangers' role in climate change adaptation, mitigation and disaster risk reduction, they often stand at the intersection of public health, safety, and disaster and emergency response. Rangers have relevant, place-based knowledge of landscapes and the environment, reinforced by formal and informal relationships with local communities, which can significantly impact emergency services' operations, logistics and overall effectiveness. Depending on the region, rangers may perform emergency first responder duties, but this topic remains largely unexplored (IRF et al., 2022; Stolton et al., 2022). Public health, safety, and emergency planning and response have been identified as clearly within the scope of ranger duties (Appleton & Stanciu, 2023). Although these responsibilities have been identified, there is not a cohesive understanding of the implications for rangers. Recent literature recognises rangers as essential planetary health workers and the expansion of their duties during natural disasters and global pandemics, but a deeper, targeted analysis of rangers' role as emergency first responders is needed (Aisha et al., 2024; Singh et al., 2021b; Stolton et al., 2023).

Few studies examine rangers' roles as first responders, therefore, highlighting workforce limitations and the mechanisms underlying them can provide support for recognition by international bodies, governments and employers. Further, these limitations can indicate specific areas of need related to professionalisation, working conditions, capacity or support structures. Highlighting ranger contributions that are overlooked or underappreciated demonstrates the vital nature of ranger work, building momentum for policy change. The current dialogue must shift to acknowledge the broader multi-sector value of rangers beyond environmental conservation, which can unlock future opportunities for the improvement of the ranger profession. This paper aims to provide insights about how rangers in Asia perceive their role as first responders and to identify relevant limitations and challenges rangers encounter while performing these duties. Further, this exploratory paper seeks to better understand the growing expectations and responsibilities of rangers, contributing towards better outcomes for public health, safety, disaster risk reduction and conservation.

METHODS

This paper uses two primary data sources: 1) a regional online survey of rangers in Asia; and 2) a focal group discussion at the Asian Ranger Forum (ARF) in Guwahati, India in December 2023, both coordinated by IRF and URSA. The single-stage survey followed a cross-sectional design, revealing trends, attitudes and responses of 52 rangers from across Asia. The survey was administered in English, via Google Forms and distributed by ARF's WhatsApp group, ranger associations, and by QR codes. Respondents were self-selected based on voluntary recruitment materials, and survey questions were a combination of demographic, Likert scale, dichotomous and multiple response questions. All respondents received information about the survey's purpose, data use and confidentiality, and provided consent to participate voluntarily prior to completing the questionnaire. Data were anonymous and aggregated by country, therefore none of the data can be used to personally identify any of the survey respondents. The survey explored a variety of topics related to rangers' role in emergency response including expanded duties, equipment and safety. The ARF focal group discussion engaged over 150 rangers and conservation practitioners from across Asia. The session structure included case study discussions complemented by interactive question-and-answer segments involving both panellists and the audience. This session served as an opportunity to share perspectives and qualitative anecdotes on emergency and disaster response, how rangers are currently contributing within this space, and what gaps and barriers exist.



Singye Wangmo using walkie talkie in Royal Manas National Park, Bhutan © Simon Rawles / WWF-UK

Insights from the survey and the focal group discussion have revealed broad themes about rangers and their work as emergency first responders.

It is important to acknowledge the limitations of this study, including language, sample size, and geographic location of participants. While most rangers at the 2023 ARF had a working knowledge of the English language, some rangers' English proficiency either excluded them from participation or potentially impacted their answers. A plurality of survey respondents (37 per cent) were from India, due to the ARF being held there and the higher level of English language proficiency in the country. This may bias results and limit the study's generalisability to the broader region. This study's sample size is adequate to capture a general impression of ranger perceptions but is not statistically significant and ultimately insufficient to draw conclusions at regional or national levels. Finally, this survey primarily focused on rangers' role as first responders during extreme weather events and natural disasters. For a more complete perspective, future studies should expand the scope to include ranger contributions to routine emergencies.

LITERATURE REVIEW

Acknowledging reality: Rangers are already emergency first responders

Urban areas typically have better access to emergency services due to the density of first responder staff and resources, but these essential services are more limited for rural or remote communities. PCAs, the foundation of area-based conservation, are often expansive natural terrestrial and marine zones commonly located in rural or remote areas. Rangers may be the only available personnel to respond to emergencies impacting the rural

communities, visitors and others in the vicinity of a PCA (Stolton et al., 2022). A 2020 study validates these findings, indicating that 50 per cent of rangers in South America were based in a remote location, followed by Asia (40.5 per cent), Africa (38.6 per cent), and Central America and the Caribbean (26.9 per cent) (Singh et al., 2021b). In these cases, rangers can expand and enhance first responder capacity where other emergency services agencies are insufficient or unavailable.

Rangers' unique qualifications and rural work locations can make them the most practical resource to fill critical gaps during emergencies. During wildfires, rangers coordinate fire suppression efforts, evacuations, and protect homes and vulnerable wildlife habitats (Appleton & Stanciu, 2023; IRF, 2019). Similarly, during floods or severe storms, rangers are instrumental in conducting evacuations, rescues, and delivering critical supplies (Aisha et al., 2024). During the COVID-19 pandemic, rangers provided emergency medical assistance, enforced public health orders, delivered rations to communities and distributed health kits (Singh et al., 2021b). ARF survey responses showed that 49 per cent of rangers in Asia were assigned as first responders during extreme weather or natural disasters. Besides large-scale emergencies, rangers also respond to more frequent, routine incidents such as a PCA visitor with a medical emergency, a vehicle collision, or human-wildlife conflict resulting in injuries. There is a universal requirement for all rangers to be able to "prevent and respond correctly to accidents and emergencies" (Appleton & Stanciu, 2023). These job requirements often resemble those of other public servants including police, firefighters or emergency medical services.

Deficits in support, training and workforce conditions limit effectiveness and increase risk for rangers

Although rangers around the world perform emergency first responder duties, many countries do not recognise rangers as essential workers or first responders, resulting in limited government support, resources and training opportunities (Singh et al., 2021b). In certain instances, rangers may already be recognised as essential frontline workers, but still do not receive the same benefits as other essential workers, including comparable salary, medical insurance, or relevant training and equipment (Belecky et al., 2021b). The 2019 Life on the Frontline study showed over 75 per cent of rangers did not receive annual first aid or emergency training and 56.9 per cent of rangers did not have access to communications equipment while on patrol (Belecky et al., 2019). These training, equipment and benefit limitations jeopardise the safety and health of both rangers and the communities they serve. When rangers do not have access to training for first aid or disaster response, or the appropriate communications or safety equipment, it degrades their ability to perform their duties effectively and safely. Growing research supports this, with data from 2006–2021 indicating that ranger deaths related to drowning and firefighting are increasing substantially, potentially related to the sharp increase in extreme weather events (Galliers et al., 2022). At 24.7 per cent, human–elephant conflict (declared a disaster in some countries) is the second leading cause of ranger deaths in Sri Lanka and has resulted in significant property damage, injury and death in local communities (Prakash et al., 2021).

Understanding specifically how rangers respond to emergencies and what obstacles prevent them from effectively performing these duties can reveal critical gaps related to working conditions, standards, capacity and government support. Similarly, it is imperative to continue highlighting ranger contributions as first responders to advocate for recognition from international bodies like the International Labour Organization (ILO). Acknowledging rangers' diverse contributions in sectors beyond conservation is essential for identifying new institutional support pathways to enhance the ranger profession.

SURVEY RESULTS AND THEMATIC DISCUSSION

A total of 52 rangers were surveyed from 12 countries in the Asia-Pacific region. 79 per cent of respondents were male and 21.2 per cent were female. A majority of rangers (73 per cent) were between the ages of 30 and 50

years old. Only 17 per cent of rangers had served for more than 20 years and nearly one-third (31 per cent) had served for 10–15 years.

The quantitative survey data and qualitative insights from the focal group discussion shed light on four thematic elements of rangers' role as first responders. These themes underscore the increasing demands placed on rangers and key shortcomings that must be addressed for rangers to do their jobs professionally and effectively.

Detrimental impact of emergencies and natural disasters on rangers and their work

Extreme weather events and natural disasters have detrimental impacts on rangers and their work; 75 per cent of rangers reported increased frequency of extreme weather events (e.g. floods, heatwaves), with 71 per cent noting increased intensity of these events. While most rangers (69 per cent) reported no injuries from extreme weather events, 89 per cent of rangers reported that their region had been impacted in some manner by extreme weather or disasters and 69 per cent noted that their workstation was negatively impacted. These crises are also detrimental to a majority of rangers' routine work, reducing their ability to conduct law enforcement patrols, habitat management, visitor engagement, community outreach, human–wildlife conflict mitigation, and wildlife monitoring (see Figure 1). Similarly, findings from studies on the impact of the COVID-19 pandemic and the 2022 flood disaster in Pakistan show rangers' routine work is adversely affected by disasters (Aisha et al., 2024; Singh et al., 2021b). Depending on the specific nature of the extreme weather event or disaster, routine ranger duties can be degraded due to declines in visitors, reduced access to sites within PCAs, diversion of essential supplies, or movement control measures (Aisha et al., 2024; Singh et al., 2021b). Finally, 40 per cent of rangers reported that extreme weather or disaster events resulted in lost or damaged equipment and 53.8 per cent stated their department did not provide replacement equipment or personal belongings following a disaster.

While these emergencies would negatively impact any organisation, a common thread that emerged from the data was the need for more rangers. Disasters and large-scale emergencies amplify the challenges posed by an already existing shortage of ranger personnel (Appleton et al., 2022). The impact of disasters on rangers and their work can perhaps be mitigated by a more robust workforce with the capacity to sustain essential routine operations while simultaneously responding to emergencies.

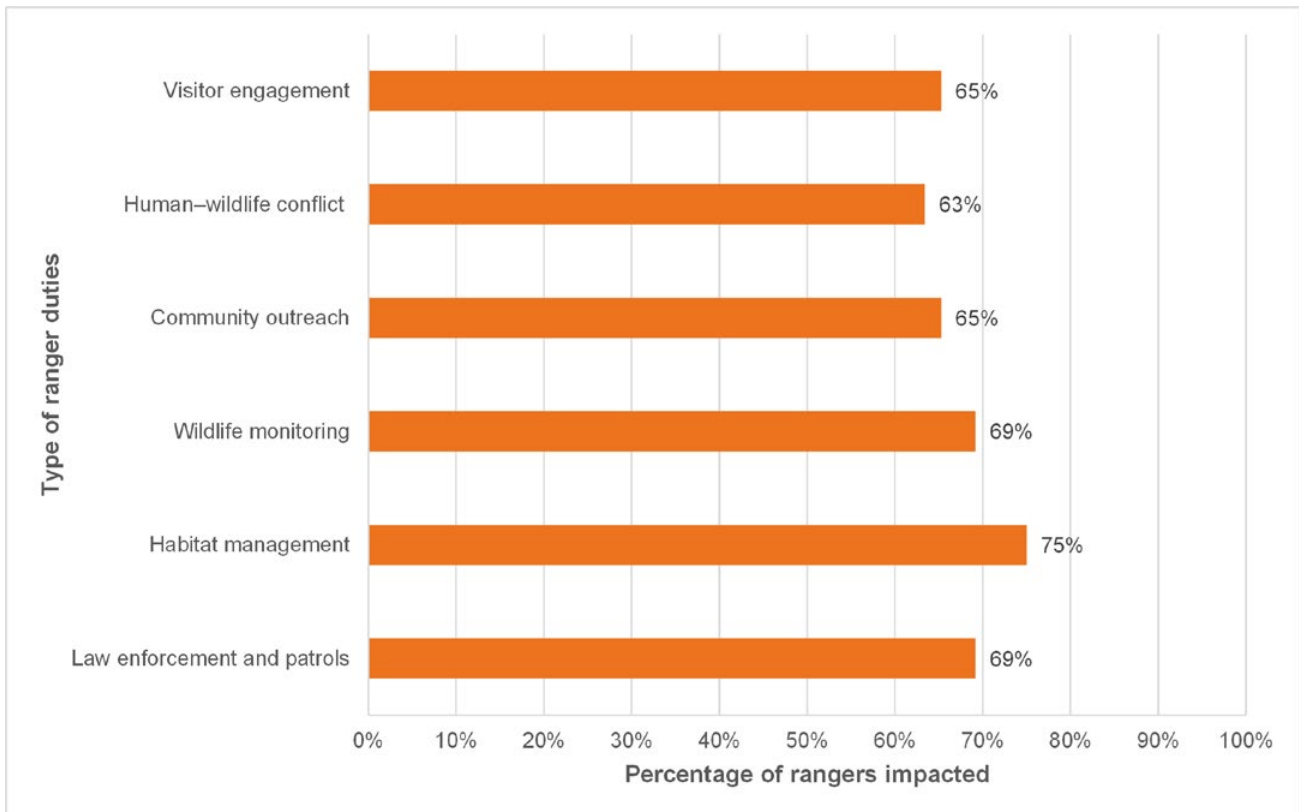


Figure 1. Percentage of rangers in Asia reporting work impacts from extreme weather or disasters, indicating widespread effects across various routine ranger duties.

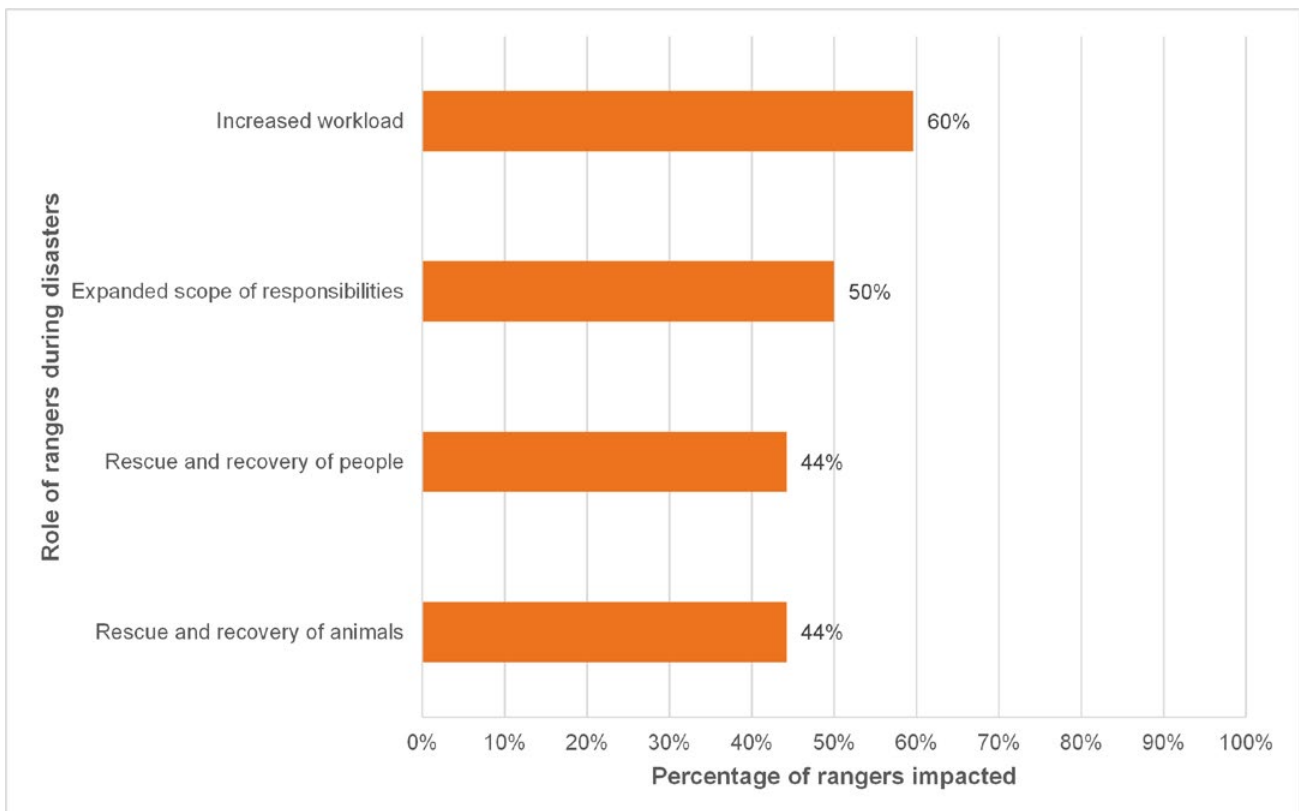


Figure 2. Percentage of rangers in Asia reporting additional tasks and responsibilities during extreme weather or natural disasters.

Emergencies and increased responsibilities for rangers

During disasters and extreme weather events, 50 per cent of rangers reported expanded responsibilities and a majority (60 per cent) had an increase in workload. Employers and managers assign rangers to perform duties including evacuation of communities; rescue and recovery of humans, wildlife and livestock; and distribution of essential goods (see Figure 2). For example, the focal group discussion revealed that Bhutanese rangers' routine duties evolved, shifting to border patrol, repairing important infrastructure, delivering food, and waste management during the COVID-19 pandemic. Viewpoints shared during the discussion also communicated rangers' contributions to saving peoples' lives and homes during fires in Australia, indicating expanded responsibilities related to fire suppression and management.

Large-scale disasters can rapidly overwhelm available emergency services staff and resources, shifting demands onto other personnel. Although some countries (India, Bhutan and Nepal) recognise rangers as essential workers, many other countries do not. Essential worker designation may only be temporary or conditional, during the aftermath of a disaster, or it may not occur at all. Rangers are more commonly asked to perform duties and assume responsibilities of emergency first responders without receiving the official recognition of these added responsibilities. Focal group discussions indicated that when there was a critical need for personnel support, rangers were quickly designated as essential workers, but when essential workers were prioritised to receive the COVID-19 vaccine, rangers did not receive this benefit. Compared to other essential workers, this places a disproportionate burden on rangers, demonstrating a misalignment between employment requirements and benefits. Additional research, awareness campaigns and advocacy can incrementally reframe the perceived role of rangers to accurately reflect their first responder job requirements. This can provide the validation necessary to support the equal employment benefits for rangers.

Training, equipment, capacity and support deficits

Fifty-four per cent of rangers in Asia felt unsafe while performing their duties during a disaster or extreme weather event. There are many potential contributing factors to this, including lack of the training and equipment necessary to perform emergency first responder duties. A majority (62 per cent) of rangers reported either inadequate first responder training or uncertainty about the adequacy of their training. The

ranger perceptions regarding training are consistent with the reported training frequency, as a majority of rangers surveyed did not receive training in disaster risk reduction, medical support, flood response or emergency evacuations (see Figure 3). Specifically, Figure 3 shows over 60 per cent of rangers did not receive any of the categories of training included in the survey, with the most significant training deficiency reported for flood response training at 92 per cent.

The challenges posed by inadequate emergency and disaster training are exacerbated by a lack of essential equipment. Nearly half (46 per cent) of rangers did not have access to flood response equipment and 62 per cent of rangers reported they do not have access to sufficient equipment or skills to rescue or translocate wildlife. Of the rangers surveyed, 36.5 per cent did not have access to official communications devices during a disaster. This is consistent with the global and Asia regional findings from the Life on the Frontline study, which reported a lack of communications equipment for 38 per cent of rangers on patrol (Belecky et al., 2019). Life on the Frontline also indicated 38 per cent of rangers in Asia used their personal funds to purchase communications devices (Belecky et al., 2019). Finally, 40 per cent of rangers reported that extreme weather or disaster events resulted in lost or damaged equipment and most (54 per cent) stated their department did not provide replacement equipment or personal belongings following a disaster.

Externally supported (aid funding and conservation NGO-funded) equipment or training are sometimes the only forms of continued support that rangers receive in some regions. The persistent training and equipment deficits highlighted in the survey results indicate that structural changes are needed within existing organisational and governmental institutions in Asia. This need for institutional change is reflected at a global level, where conservation NGOs continue to address urgent ranger support gaps around the world. This external assistance is crucial; however, it should be considered a temporary measure. To create enduring change, employers and governments must acknowledge rangers' role as first responders so rangers can begin to receive additional funding, support and prioritisation.

First responders benefit communities and conservation

The focal group discussion identified rangers' role as emergency first responders as a mechanism to increase legitimacy and build trust with communities. Of rangers surveyed, 60 per cent identified themselves as local community members or Indigenous people (see Figure 4). Place-based and community affiliations often manifest in

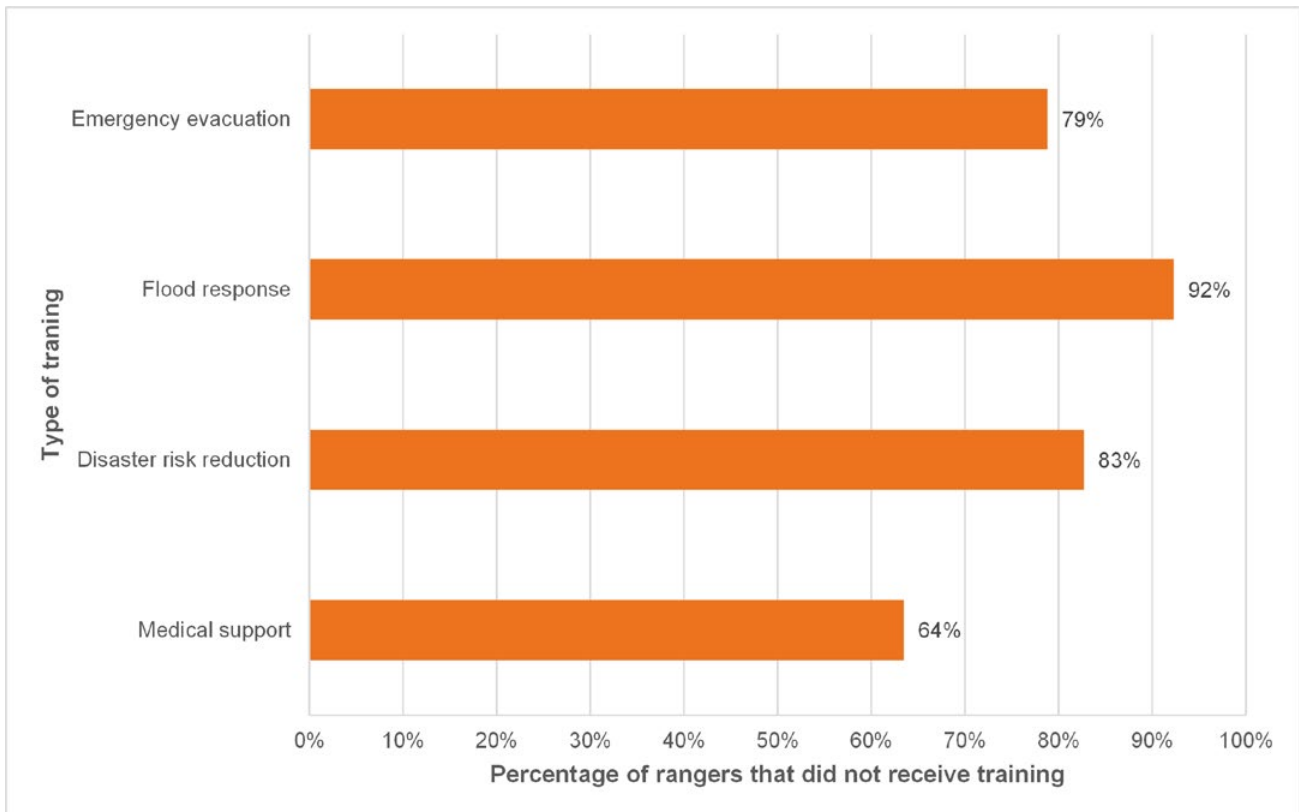


Figure 3. Percentage of rangers in Asia reporting that they did not receive training in the previous 12 months on emergency evacuation, flood response, disaster risk reduction or medical support.



Firefighting in a peat swamp (KSDA). Palangkaraya, Central Kalimantan (Borneo), Indonesia © Alain Compost / WWF



Forest Guards and park rangers having a quick brief before they head into the forest for their patrol at Thua Thien Hue Saola Nature Reserve, Viet Nam © WWF-US / Justin Mott

rangers' inherent commitment to serve their fellow community members (Aisha et al., 2024). Despite this, ranger–community relationships can often be strained and complicated, reflecting a legacy of colonialism, inequality and violence (Stolton et al., 2022). Historically, many Indigenous people and local communities (IPLCs) have been forcibly displaced and denied access to their ancestral lands after areas have been designated as PCAs. This distrust has intensified with recent cases of corruption and human rights abuses perpetrated by rangers, damaging the credibility of conservation efforts, rangers, their employers and NGOs that support them (Belecky et al., 2021a; Brockington et al., 2007; People not Poaching, 2022). These challenges emphasise the compelling need for professionalisation and accountability within the ranger workforce and intentional efforts to build strong ranger–community relationships.

Indigenous people and local communities' trust and support is shown to decrease the likelihood of poaching in PCAs (Belecky et al., 2019). Prioritising a rights-based, collaborative approach to conservation that engages IPLCs can add value by reducing misunderstandings and conflict and increasing compliance and reporting of illegal activity (Ackerley et al., 2023; Belecky et al., 2019; Moreto et al., 2017; People not Poaching, 2022; Stolton et al., 2022). This approach also acknowledges the interconnectedness between IPLCs and nature, and their inherent rights, ensuring just, inclusive outcomes for everyone.

The Chitwan Declaration adopted at the 2019 World Ranger Congress specifically addresses building mutually respectful, transparent, trusting relationships with communities as a top priority (IRF, 2019). URSA's Building Trust with Rangers and Communities scoping report calls for rangers to become community first responders, prepared to use first aid skills during medical emergencies, including women in labour or accidents (Stolton et al., 2022). Rangers' assistance with these incidents represents beneficial, constructive interactions with communities, building rapport and mutual respect. Every incident response is an opportunity to demonstrate that rangers are a reliable and trustworthy resource committed to serving communities (Stolton et al., 2022).

Attitudes expressed within focal group discussions and the broader ranger literature indicate that enhanced community–ranger relationships are a beneficial byproduct of rangers' role as emergency first responders. Therefore, rangers must be encouraged, trained and equipped to maintain and improve their contributions to emergency and disaster response, which enhances PCA management, conservation outcomes, and the health and well-being of both rangers and IPLCs.

CONCLUSION

Growing frequency and intensity of extreme weather and large-scale disaster events are increasing the scope of duties, responsibilities and demands placed on rangers. These events also highlight the growing need for a professional ranger workforce with the capacity to

function as emergency first responders. This study's findings indicate that rangers already function as emergency first responders in diverse contexts. Despite this indispensable role, rangers are often met with little recognition and support, and a majority of rangers feel underequipped, undertrained and unsafe performing first responder duties. These results mirror trends reflected in the broader ranger sector and raise important considerations supporting the call for policy change within international and national governmental institutions.

While the limitations of this study prevent its application to entire countries or the Asia Pacific region, the themes presented provide foundational perspectives on rangers' contributions as first responders. Perceptions from the survey reveal some of the specific functions and capabilities rangers provide during emergencies, demonstrating their adaptability, versatility and unique value as frontline essential workers. Responsibilities including, but not limited to, evacuation support, rescue, recovery, and delivering essential goods are assigned to rangers during emergencies or natural disasters. This study also shows there are serious shortcomings that limit rangers' ability to perform these duties effectively and safely. Communications devices, medical training and flood response equipment are examples of resource and training gaps impacting rangers. Improvements to ranger working conditions are broadly beneficial for the ranger workforce and conservation, but also support rangers in the execution of duties related to public health, safety and disaster response. Rangers' critical multi-sector contributions introduce opportunities to access new funding sources external to conservation.

Beyond resource and support limitations, additional considerations related to legal constraints and liability can have serious implications for rangers and their employers. Additional research is needed to understand current roles and responsibilities, required qualifications or licensing, and legal conditions rangers must operate within and how these are regulated. While rangers are expected to perform first responder duties without sufficient training and support, it remains unclear how they are navigating the legal fulfilment of these duties within complex insurance and liability considerations. All of these factors amplify the legal and personal safety risks rangers encounter while responding to emergencies when compared to conventional first responders. Therefore, within relevant regionally specific contexts and legal constraints, it should also be considered whether rangers are the most suitable personnel to perform first responder duties.

With this study's focus on extreme weather events and natural disasters, future research should investigate rangers' role during routine emergencies, including vehicle accidents or PCA visitors with a medical emergency. Such research would complement the insights from this study's survey and focal group discussion, providing a more comprehensive understanding of the regional status of rangers' contributions to emergency response. Additionally, increasing the sample size in subsequent research will capture additional nuance and provide results that are more broadly representative of the region. This study's findings also suggest that improved ranger–community relationships are a beneficial byproduct of rangers' fulfilment of an emergency first responder role. Future research endeavours could further explore the intersection between ranger first responder duties and ranger–community relationships.

This study contributes to the developing discussion of rangers' role as emergency first responders, but additional research is essential to fully understand the depth and breadth of this role. These insights are crucial for accurately representing and communicating rangers' contributions within relevant institutions, which can then address ranger training, equipment and support requirements. Addressing the needs of the ranger workforce not only supports conservation efforts, but also enables rangers to effectively perform emergency first responder duties, which are critical for effective public health and safety measures and disaster management.

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RESUMEN

El papel de los guardabosques como primeros intervinientes en emergencias es cada vez más importante ante la escalada de desastres naturales y fenómenos meteorológicos extremos relacionados con el clima. Sobre la base de una revisión de la literatura y los datos recogidos de las encuestas y discusiones de grupos focales, este estudio explora el papel de los guardaparques como primeros en responder en Asia. Se encuestó a 52 guardabosques de 12 países, lo que revela las diversas expectativas, responsabilidades y retos a los que se enfrentan. De ellos, el 59,6% había experimentado un aumento de sus responsabilidades durante una catástrofe, incluidas las evacuaciones, las operaciones de rescate y recuperación, y la entrega de suministros esenciales como alimentos y agua. A pesar de su contribución esencial, la mayoría (más del 60%) de los guardas encuestados no había recibido formación en primeros auxilios, respuesta a inundaciones, evacuación de emergencia o respuesta a catástrofes. Aunque los resultados variaron en función de la cuestión específica, las conclusiones generales indican una necesidad urgente de cambios políticos para profesionalizar la mano de obra de los guardabosques, mejorar la formación y el acceso a los recursos, y establecer sistemas de apoyo institucional para los guardabosques. Destacar las contribuciones de los guardabosques fuera de la conservación aumenta la visibilidad del valor único que los guardabosques añaden en otros sectores como la salud pública y la seguridad.

RÉSUMÉ

Le rôle des gardes forestiers en tant que premiers intervenants en cas d'urgence devient de plus en plus important face à l'escalade des catastrophes naturelles liées au climat et aux événements météorologiques extrêmes. Cette étude explore le rôle des rangers en tant que premiers intervenants en Asie, en s'appuyant sur une revue de la littérature et sur des données recueillies lors d'enquêtes et de discussions de groupes focaux. Au total, 52 gardes forestiers de 12 pays ont été interrogés, révélant la diversité des attentes, des responsabilités et des défis auxquels les gardes forestiers sont confrontés. Parmi eux, 59,6 % ont vu leurs responsabilités s'accroître lors d'une catastrophe, notamment en ce qui concerne les évacuations, les opérations de sauvetage et de récupération, et l'acheminement de fournitures essentielles telles que l'eau et la nourriture. Malgré leur contribution essentielle, la majorité (plus de 60 %) des gardes interrogés n'avaient pas reçu de formation sur les premiers secours, les interventions en cas d'inondation, les évacuations d'urgence ou les interventions en cas de catastrophe. Bien que les résultats varient en fonction des questions spécifiques, les conclusions générales indiquent qu'il est urgent de modifier les politiques afin de professionnaliser les rangers, d'améliorer la formation et l'accès aux ressources, et de mettre en place des systèmes de soutien institutionnel pour les gardes forestiers. La mise en évidence des contributions des gardes forestiers en dehors de la conservation accroît la visibilité de la valeur unique que les gardes forestiers apportent dans d'autres secteurs tels que la santé et la sécurité publiques.