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## EDITED BY

Eduardo J. Naranjo,  
El Colegio de la Frontera Sur, Mexico

## REVIEWED BY

S. P. Yadav,  
International Big Cat Alliance, India  
Barney Long,  
Re:wild, United States

## \*CORRESPONDENCE

Rohit Singh  
✉ rsingh@wwf.sg

RECEIVED 27 May 2024

ACCEPTED 17 October 2024

PUBLISHED 13 November 2024

## CITATION

Lebon H, Singh R, Abdulla AF, Ahmed K and Aisha H (2024) Understanding the impact of working conditions on ranger vulnerability to corruption: insights from a global survey. *Front. Conserv. Sci.* 5:1438936. doi: 10.3389/fcosc.2024.1438936

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# Understanding the impact of working conditions on ranger vulnerability to corruption: insights from a global survey

Héloïse Lebon<sup>1</sup>, Rohit Singh<sup>2\*</sup>, Amal Fathima Abdulla<sup>3</sup>, Kaleem Ahmed<sup>3</sup> and Hamera Aisha<sup>4</sup>

<sup>1</sup>Department of Geography, King's College London, London, United Kingdom, <sup>2</sup>Wildlife Practice, World Wildlife Fund, Washington, DC, United States, <sup>3</sup>Department of Wildlife Sciences, Aligarh Muslim University, Aligarh, India, <sup>4</sup>Wildlife Practice, World Wide Fund for Nature-Pakistan (WWF-Pakistan), Lahore, Pakistan

Rangers play a crucial role on the frontline of conservation; however, they often face difficult and sometimes dangerous working conditions, along with inadequate pay, equipment, training, and recognition. This study aims to determine the influence of rangers' working conditions on their vulnerability to corruption using correlation analysis. The research utilized the Global Ranger Perception Survey 2019 dataset, a global-scale survey that collected responses from 6,101 rangers across 25 countries on various aspects of their working conditions. We further analyzed the results by gender and geographic region. Key findings indicate that women have a lower propensity to engage in corrupt activities. Conversely, at the regional level, Latin America demonstrates a heightened susceptibility to corruption compared to other regions. Additionally, there is a strong correlation between corruption and certain aspects of rangers' working conditions in Latin America. Future assessments, such as the State of the Ranger Report, could provide a monitoring mechanism to evaluate the long-term effects of improvements in rangers' working conditions and their potential vulnerability to corruption worldwide. Country-specific or even landscape-specific in-depth studies would be valuable for developing targeted strategies to address corruption within the workforce while also improving rangers' working conditions.

## KEYWORDS

corruption, rangers, working conditions, vulnerability, gender, welfare, legitimacy

## 1 Introduction

While no universally accepted legal definition of corruption exists, the UNEP Anti-Fraud and Anti-Corruption Guidelines provide a helpful characterization, describing it as 'any act or omission that misuses official authority or that seeks to influence the misuse of official authority in order to obtain an undue benefit for oneself or a third party' ([United Nations](#)

Environment Programme, 2020). Corruption poses a serious threat to global environmental conservation efforts and sustainability as it enables illicit activities such as poaching, illegal logging and fishing, and wildlife trafficking (Zain, 2020). When corrupt practices infiltrate regulatory bodies, environmental laws may go unenforced, resulting in unchecked pollution, habitat destruction, and unsustainable resource exploitation (Tanzi, 1998). The misallocation and mismanagement of natural resources due to corruption further exacerbate environmental issues, including deforestation and ecosystem degradation (Lederman et al., 2005).

Rangers play a critical role in the complex intersection of environmental crime, corruption, and human rights. Rangers, as defined by the International Rangers Federation (IRF), are crucial figures in conservation, tasked with protecting natural, cultural and historical heritage, and ensuring the well-being of present and future generations. Effective conservation management relies on having a sufficient number of skilled, well-equipped, well-led and responsible rangers, encompassing diverse backgrounds, including Indigenous People and local community members, and exhibiting gender diversity (International Ranger Federation, 2019a; 2019b). Portrayals of wildlife rangers are often polarized, depicting them as either heroic saviors combating poachers or as corrupt individuals involved in human rights violations, but in reality, rangers can play key roles in both halting and perpetuating corrupt acts (Dutta, 2020).

Rangers may be motivated to engage in corrupt practices due to economic reasons (like not getting paid enough or on time), pressures from their organization (like being told by higher-ups to be corrupt), and social factors (like seeing that rules are applied unfairly to different groups). Corruption risk stems from various sources, including internal factors like inadequate oversight, unclear or undocumented processes, and the prevailing organizational and occupational culture. Additionally, external factors, such as weak legislative and policy frameworks, social pressures in rural communities, and cynicism, also play a role in contributing to corruption risk (Marquette and Peiffer, 2021). This, in turn, leads to a gradual decline in trust between rangers and the communities they serve (Belecky et al., 2021a).

While economic motivation is the most commonly cited driver, a multitude of other risk factors influence a ranger's overall vulnerability to corruption (Duffy, 2014). Therefore, it is essential to analyze both the corrupt acts and actors, while also accounting for corruption risks and opportunities arising from systemic vulnerabilities (Moreto et al., 2019; Belecky et al., 2021a). These distinctions are not always straightforward; motivations and enabling factors frequently intertwine and bolster each other (Kassa et al., 2019).

Comprehending the social, organizational, and political context in which rangers operate can contribute to a better understanding of the intricate ways in which corruption impacts wildlife and natural resource conservation, as well as the individuals engaged in these endeavors (Moreto, 2016). Additionally, understanding these factors is crucial for developing effective strategies to combat corruption and promote sustainable conservation efforts. Factors such as low salaries, lack of organizational support and infrastructure, social pressures, inadequate training, and lack of

equipment all contribute to rangers' overall vulnerability to corruption (Belecky et al., 2021b; Fynn and Kolawole, 2020). The most recent comprehensive global study on protected areas' effectiveness revealed that 40% of these areas are managed ineffectively. A key finding of the study was the insufficient presence of skilled staff, indicating a significant weakness in current management practices (Leverington et al., 2010).

Analyzing the link between the conditions under which rangers operate and their inclination toward corruption is crucial. A deeper comprehension of the organizational and situational elements that contribute to corruption among rangers can inform more effective strategies to tackle this problem. Through such examinations, policymakers and conservation leaders can introduce measures to enhance working conditions, increase responsibility, and lower the chances of corruption among rangers. Nurturing integrity and ethical behavior within the workforce can bolster more effective conservation endeavors and protect endangered species (Belecky et al., 2021a).

The examination of corruption within the law enforcement sector extends beyond the ranger workforce and encompasses a variety of factors. For instance, research has explored how civil servants' perceptions about their working conditions, including relationships with colleagues, salaries, and job satisfaction, can contribute as a "risk factor for corruption" within Iraq's public sector (Bertrand et al., 2020). Investigations within the police forces have indicated that working conditions can influence the likelihood of corrupt behavior among individuals (Williams, 2002). It's crucial to approach comparisons between rangers and other sectors with care, considering the inherent differences in their responsibilities and working conditions. For example, studies on police deviance often concentrate on urban police settings, highlighting the need for nuanced analysis (Belecky et al., 2021a).

The Global Ranger Perception Survey represents a significant study that delves into the working conditions of rangers, focusing on their perceptions, attitudes, and the prevalence and impacts of corruption (Belecky et al., 2019; Singh et al., 2020). Building on the results of the survey, this research addresses a gap in the literature by examining how rangers perceive corruption and its connection to their challenging working conditions. This study utilized responses captured in the Global Ranger Perception Survey to identify the underlying factors that contribute to corruption within the ranger profession and investigate the relationship between rangers' working conditions and their involvement in corruption.

## 2 Materials and methods

### 2.1 Survey design and data collection methods

This study utilized data from a ranger perception survey (RPS) conducted between 2016 and 2019 across 25 countries (Belecky et al., 2019). All rangers surveyed in this study were employed in the public sector, indicating that their roles involved accountability and responsibilities to a government authority. Participants were presented with a written informed consent document in their

TABLE 1 Region-wise statistics of rangers interviewed as part of the global ranger perception survey.

Region	No of rangers surveyed	Estimated number of rangers in the region (Belecky et al., 2019)	Percentage of surveyed rangers per region	Gender	
				Women(%)	Men(%)
Africa	2061	10324	33.7	11.2	88.8
Central Asia	276	1200	4.5	5.8	94.2
Latin America	301	5123	4.9	26.7	73.3
South Asia	1783	66696	29.2	4.3	95.6
Southeast Asia	1680	13944	27.5	4.3	95.6
<b>Total</b>	<b>6101</b>	<b>97287</b>	<b>100</b>	<b>10.46</b>	<b>89.5</b>

The values in bold represent the total number of rangers who participated in the Global Ranger Perception Survey across Africa, Central Asia, Latin America, South Asia, and Southeast Asia. This includes the estimated total number of rangers working in these regions, as well as the overall percentage representation of rangers from each region, with further details provided through gender-specific bifurcated percentages for each region.

local language, and they provided verbal consent to participate. The overall RPS received approval from the University of Central Florida Institutional Review Board (SBE-16-12184) (Belecky et al., 2019) (Table 1). The rangers involved in patrolling activities regularly were given special focus. The research questionnaire comprised of 197 questions translated into local languages and validated by experts. Different aspects of rangers' work were covered, including general perceptions of their daily responsibilities, training and equipment provision and needs, health and safety, remuneration and contracts, management, community relations, and perceptions of legal proceedings.

## 2.2 Analysis

The survey questions were organized into categories based on the methodology described in Saithibvongsa and JinKyo (2019). The questions were first divided into three overarching categories: Job motivation (JM), Job satisfaction (JS), and Job commitment (JC). This study operationalizes key constructs based on established definitions from existing literature. Job motivation, influenced by Petri and Govern's (2004) framework, is defined as the internal impetus that shapes an individual's persistence and vigor in tasks, all directed toward achieving specific goals. Job satisfaction is operationalized as an individual's contentment with their professional experience, contingent upon the fulfillment of fundamental needs and the cultivation of a positive relationship with their job. Organizational commitment, in accordance with the conceptualization by Panahi and Ghafarzadeh (2019), is characterized as an individual's belief in organizational values, accompanied by loyalty, ethical obligation, heartfelt desire, and an intrinsic motivation to remain affiliated with the organization. The categories were further divided into three sub-categories: 'achievement' 'energy' and 'misconduct' for JM; 'security' 'co-workers' and 'fulfillment' for JS; and 'training' 'organization' and 'legitimacy' for JC (Figure 1).

Questions from the survey related to each category were selected and categorized within the subcategories for analysis (see Appendix 1 in Supplementary Material). These categories are not strictly mutually exclusive, and the relationships between each subcategory and its parent category are not explicitly defined.

However, the key insight from this categorization is the potential to structure the survey questions in a way that yields insightful responses for all nine aspects. This approach can provide valuable indications about each ranger's job motivation (JM), job satisfaction (JS), and job commitment (JC). Furthermore, questions were grouped to profile rangers' overall vulnerability to corruption. Survey questions that do not relate to the research objectives were excluded from the analysis. Due to the strong positive correlation at the global level, the scores from Questions Q80/82 and Q85/87 were combined into a single "corruption" score, which will serve as the dependent variable for most of my study's tests (Appendix 1 in Supplementary Material).

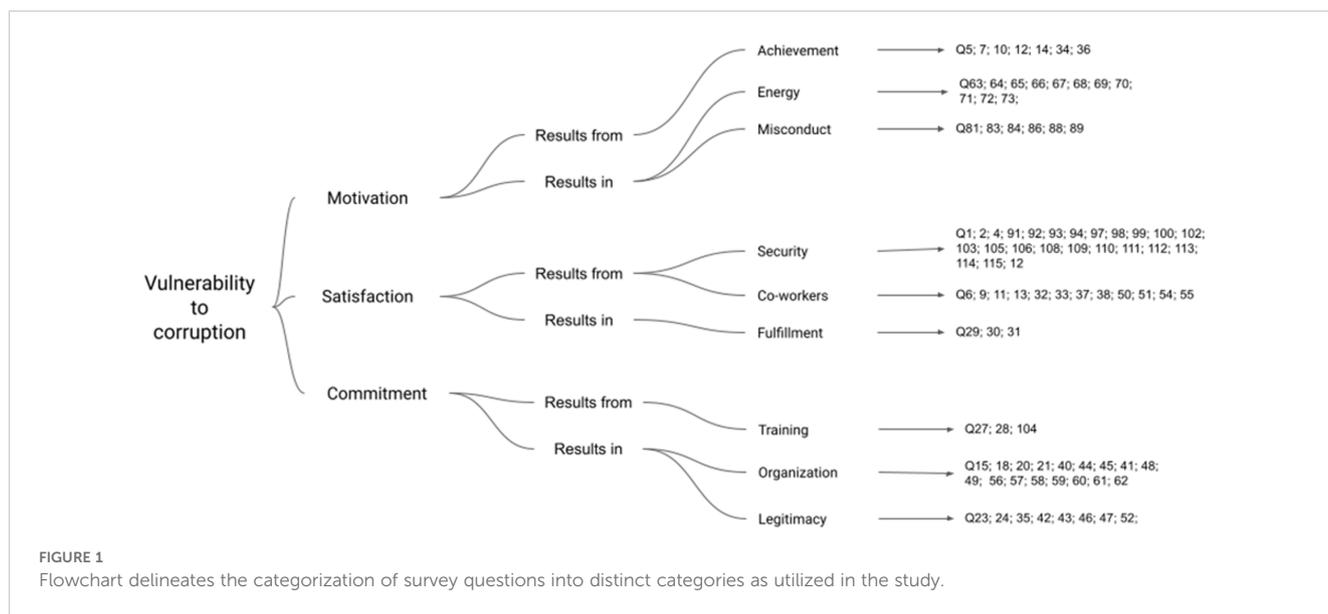
To ensure consistency across diverse survey responses and facilitate comparisons, responses within each category were aggregated and subsequently transformed into a score ranging from 0 to 1 using the range normalization approach. Additionally, respondent gender and geographical region were considered for research purposes based on the survey data. It's important to note that these responses were not on Likert scale. To identify patterns of corruption across regions, correlations between Vulnerability to Corruption (VC) and working conditions were examined within different regions. All statistical analyses were conducted using SPSS version 27.0.

## 3 Results

### 3.1 Rangers' relationship toward corruption

Out of 197 questions, 95 questions relevant to corruption were included in the final analysis. In the context of investigating attitudes toward corrupt activities, the study focuses on two specific behaviors: "Accepting a bribe (such as money)" and "Poaching protected animals and/or plants to sell for profit."

On a global level, rangers' attitudes toward corruption correlated with their perceptions of fellow rangers' view of the issue (see Table 2). The coefficient of 0.4896 shows a statistically significant positive correlation between personal attitudes toward corruption and perceived seriousness among fellow rangers.



Exploring the correlation between an individual’s attitudes toward corruption and their perceptions of fellow rangers’ attitudes (Figure 2). On a regional level, Latin America (0.770) and South Asia (0.761) displayed particularly strong positive correlations, while Central and Southeast Asia showed a significantly weaker, though still significant, correlation (0.380). Furthermore, men exhibited a much stronger positive correlation between the two variables compared to women (0.735 versus 0.360). A correlation analysis was conducted to investigate the association between participants’ inclination to report a fellow ranger for engaging in corrupt activities and the impact of safety concerns on this inclination (Figure 3; Table 3).

On a global scale, rangers’ scores related to ‘corruption’ exhibited positivity, indicating that the majority of rangers worldwide perceive corruption as a significant wrongdoing. Furthermore, the analysis suggests that there are regional and gender variations in how personal attitudes toward corruption align with perceptions of fellow rangers.

### 3.2 Correlation between motivation, satisfaction, and commitment

#### 3.2.1 Job Motivation (JM)

The variable ‘JM’ encompasses 18 survey questions and JM is the variable with the highest and most positive scores out of the

three main blocks, both at the global and regional scale (except in Africa, where JS supersedes JM). However, no significant correlation was found between JM and vulnerability to corruption (VC) at the global level. Lastly, while the elements included in the sub-block ‘achievement’ (i.e., opportunities to develop oneself, feeling rewarded) appear to have a direct positive influence on JM, ‘energy’ and ‘misconduct’ are only results of an individual’s JM.

While no significant correlation between VC and any of the 9 sub-blocs was detected at the global level, some interesting results are visible at the regional level (Figure 4). Significant positive correlations appear in Latin America between VC and both ‘achievement’ and ‘energy’ while correlations are visible in South Asia between VC and both ‘achievement’ and ‘misconduct’.

#### 3.2.2 Job Satisfaction (JS)

At the global level, the mean score for JS (0.69). This implies rangers’ overall attitude toward their daily working conditions may not influence their VC.

Positive correlations between VC and the sub-block ‘security’ in Africa and Latin America were observed. Considering the high number of ranger fatalities globally and the correlation between rangers’ sense of safety and their VC, policies must be developed and implemented to increase rangers’ sense of physical, financial, and emotional security on the job.

TABLE 2 Correlation coefficients values between an individual’s attitudes toward corruption and their perceptions of fellow rangers’ attitudes with gender and regional splits (significant if coef. >.1 or <-.1).

Region	Africa	Asia	Latin America	South Asia	South East Asia
Men	0.613	0.264	0.883	0.793	0.732
Women	0.382	0.352	0.363	0.118	0.396
Total	0.61	0.38	0.77	0.761	0.684

TABLE 3 Correlation coefficients values between a respondents' willingness to report a fellow ranger for corrupt activities and the influence of safety concerns on this decision (significant if coef. >.1 or < -.1).

Region	Africa	Asia	Latin America	South Asia	South East Asia
Men	0.013	-0.086	-0.186	-0.043	-0.075
Women	-0.048	-0.185	-0.117	0	-0.126
Total	0.001	-0.0085	-0.166	-0.036	-0.08

### 3.2.3 Job Commitment (JC)

Lastly, the JC bloc encompassed 28 questions and produced the lowest mean score of the three main blocs as well as a positively skewed distribution. Furthermore, no correlation was found between JC and VC globally, except for women, with a significant positive correlation (0.122). Interestingly, at the regional scale, Latin America stands out by displaying strong positive correlations between VC and JC, for both men and women undifferentiated (0.267) and once split (0.307 for men and 0.237 for women). Increases in all three sub-blocs of JC ('training', 'organization' and 'legitimacy') were found to reduce rangers' VC in Latin America, particularly for men when it comes to 'training' (Table 4). These findings, in particular, the relationship between gender, JC and corruption, as well as regional differences in VC may suggest the need for enhanced, targeted policies to increase rangers' JC.

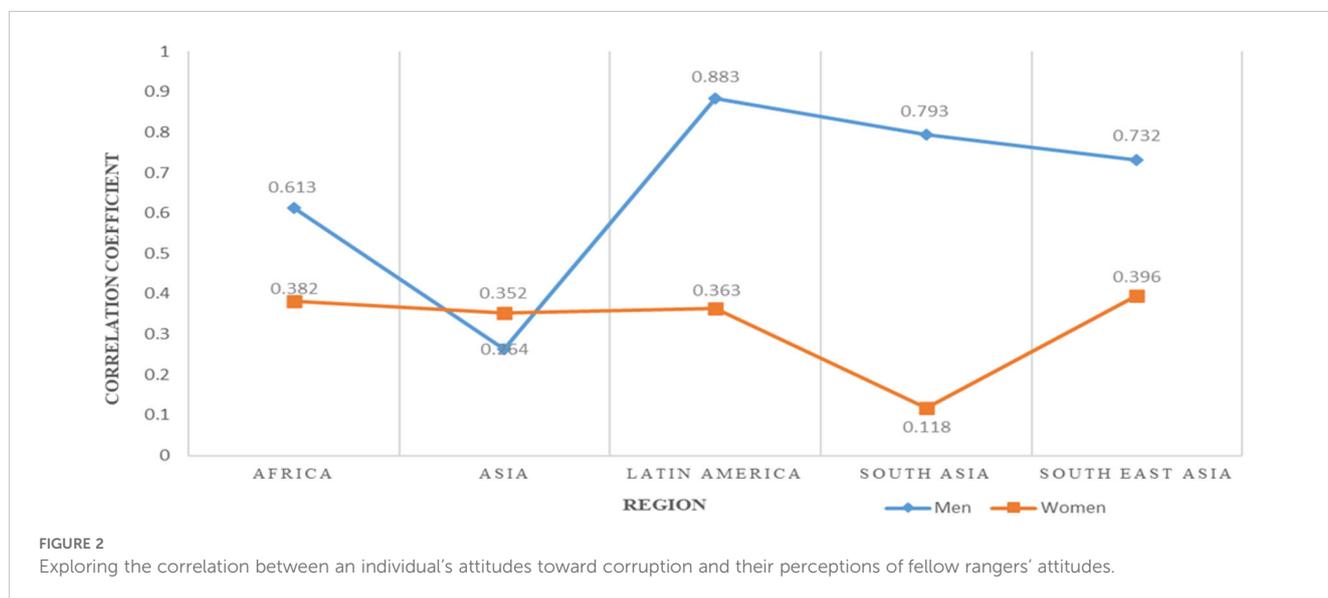
## 4 Discussion

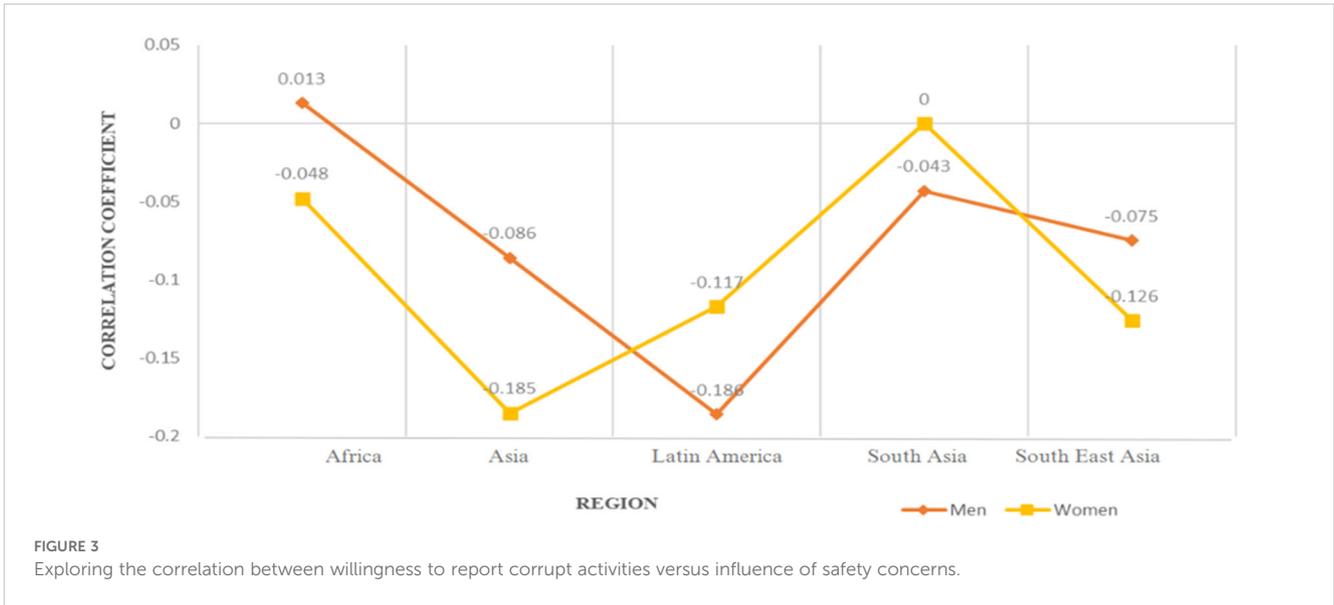
This research explored potential correlations between key aspects of rangers' working conditions and their vulnerability to corruption. The goal was to provide evidence for developing tools to combat the widespread corruption in wildlife conservation, particularly among rangers who serve on the front lines.

In the realm of regional distinctions, it is noteworthy that Latin America, in comparative terms, demonstrates a heightened susceptibility to corruption. These results align with the 2012 EIA investigative report, *The Laundering Machine: How Fraud and Corruption in Peru's Concession System are Destroying the Future of its Forests*, which highlighted that "corruption is the norm" in environmental-related businesses (Duri, 2020). This pattern may shed light on the pervasive extent of corruption within the region, enabling environmental offenses to persist despite the presence of a

TABLE 4 Correlation coefficients values job motivation, job satisfaction and job commitment (significant if coef. >.1 or < -.1).

Region	Africa	Asia	Latin America	South Asia	South East Asia
Motivation	0.016	0.147	-0.015	0.184	-0.102
Satisfaction	0.068	0.164	-0.016	-0.096	-0.034
Commitment	0.075	0.267	-0.041	0.014	0.026

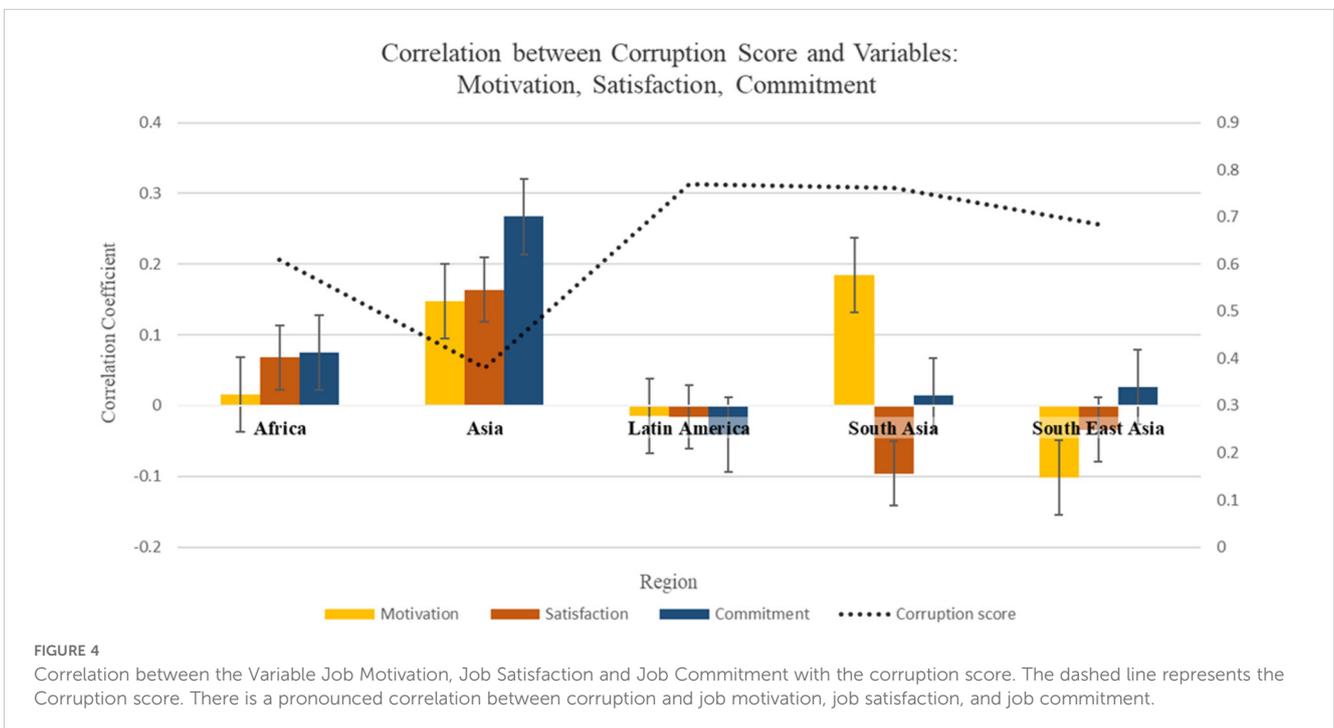




seemingly robust legal infrastructure (Duri, 2020). Substantial evidence underscores how corruption has impeded investigations, led to the selective application of laws, disrupted police operations, and even resulted in the disappearance of crucial court evidence (Duri, 2020). Prior research studies have highlighted those rangers sometimes prioritize local community members' subsistence needs and traditions over state-imposed laws or regulations, leading to potential moral conflicts and engagement in illicit activities (Dutta, 2020). Notably, Latin American rangers, despite displaying the lowest mean score for 'legitimacy,' exhibit a positive correlation with their VC. This suggests a complex portrayal of rangers (Belecky et al., 2021a). Addressing this legitimacy deficit is crucial in efforts to combat corruption in the region, although further

comprehensive research is warranted to thoroughly understand this phenomenon.

The observed correlations between 'organization' and VC for men in Africa and men and women in Latin America align with previous studies linking employees' perception of organizational fairness with corruption likelihood (Tobin and Lee, 2012). Additionally, a broader distrust in the political and legal system, such as perceived uneven application of the law or lenient penalties for individuals apprehended for wildlife crimes, correlates with ranger corruption (Belecky et al., 2021a). Such a perception can lead rangers to overlook poaching activities or release criminals in exchange for bribes (Belecky et al., 2019, 2021). These factors suggest that organizational fairness and systemic trust play crucial



roles in determining vulnerability to corruption among rangers in these regions.

This study explored the potential correlation between rangers' working conditions and their susceptibility to corruption. While few global correlations could be drawn, the study identified links between vulnerability to corruption based on rangers' gender and region. This approach yielded valuable insights into two pivotal aspects of the study.

This work underscores a growing awareness that women appear to exhibit lower susceptibility to corruption. Societies and governments with more women in leadership roles are also likely to be more democratic and transparent, which are important deterrents to corruption (Seager et al., 2021). This gender disparity has been studied in relation to corruption, as demonstrated by Swamy et al. (2001), who used the World Values Survey in 43 countries and found that women exhibited less corrupt behavior than men. This observation is also connected to broader ecofeminist theories which link the oppression of women to the harm done to nature, arguing that both come from patriarchal systems of control (Dollar et al., 2001).

Further, rangers in Latin America exhibited the highest vulnerability to corruption. Several respondents not only perceived corrupt activities as "non-serious problems" but also actively refrained from reporting them. This paints a concerning picture of an environment where corrupt activities are normalized. There were positive findings related to various aspects of rangers' working conditions, such as "achievement," "security," "training," "organization," and "legitimacy." These areas can be leveraged and enhanced to deter the culture of corruption. Improving rangers' conditions should be a goal on its own, not just a way to achieve other aims. Additionally, this approach helps reduce the risk of negative side effects.

Furthermore, apart from "legitimacy," all elements analyzed in this study are wholly or at least partially contingent on the policies of the supervising organization. Therefore, ranger employers have both an opportunity and responsibility to improve working conditions, not only to improve welfare and effectiveness, but also as a critical anti-corruption measure. Efforts to combat illegal wildlife trade and corruption often harm local communities (Moreto et al., 2019). Improving rangers' living and working conditions offers triple benefits: it enhances rangers' livelihoods, strengthens wildlife protection, and ensures respect for community members' rights. These improvements in-turn would ultimately contribute toward sustainable development and the long-term success of conservation efforts.

The aim of this research was to explore how rangers' working conditions influence their vulnerability to corruption using the ranger perception data. Future assessments, including the State of the Ranger Report currently being developed by the International Ranger Federation, will provide a monitoring mechanism to evaluate the long-term effects of improvements in ranger's working conditions and their potential vulnerability to corruption worldwide. However, a country-specific or even landscape-specific

in-depth study would be valuable in developing targeted strategies to address corruption within the workforce while also improving rangers' working conditions.

More focused research and case studies could further explore specific aspects of corruption, such as the role of incentives and accountability measures, while incorporating the perspectives and experiences of local communities. This approach would help develop more effective, equitable and accountable conservation strategies.

## Data availability statement

The datasets presented in this article are not readily available because requests have to be processed through national authorities. Requests to access the datasets should be directed to the corresponding author: rsingh@wwf.sg.

## Ethics statement

The studies involving humans were approved by the University of Central Florida Institutional Review Board (SBE-16-12184). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

HL: Conceptualization, Methodology, Writing – review & editing, Data curation, Formal analysis. RS: Conceptualization, Funding acquisition, Methodology, Resources, Writing – original draft, Writing – review & editing. AA: Data curation, Formal analysis, Software, Writing – original draft, Writing – review & editing. KA: Formal analysis, Writing – original draft, Writing – review & editing. HA: Methodology, Writing – original draft, Writing – review & editing.

## Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. Funding for this research was provided by WWF-International.

## Acknowledgments

We would like to express our gratitude to the International Ranger Federation, ranger employers, and WWF teams worldwide involved in the data collection for this research. We also extend our appreciation to the rangers who participated in the study and provided valuable feedback

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcosc.2024.1438936/full#supplementary-material>

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