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Save the Apex Predator to Save the Forest: The Case of Hukaung Tiger

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Abstract: Tigers are vital apex predators that maintain ecosystem balance, yet their populations have declined sharply due to habitat loss, poaching, and human pressures. This decline is particularly severe in Myanmar's Hukaung Valley, once the world's largest tiger reserve, where numbers have fallen to critically low levels despite conservation efforts. While environmental drivers such as deforestation, land-use change, and prey depletion are well documented, this study argues that governance breakdown is a key underlying factor. Using a qualitative research design based on semi-structured interviews with local religious leaders, youth leaders, and former conservation staffs, the study explores how weak and fragmented governance contributes to tiger decline. Thematic analysis reveals issues including dual governance, governance vacuums, weak law enforcement, transboundary failures, and armed conflict. The findings highlight that tiger conservation in the Hukaung Valley is not only an ecological issue but also a governance crisis requiring integrated solutions.

"The forest grows the way it does, because every animal senses the cautious presence of the apex predator. They learn where to hide, foot or root and bloom revolving around her."

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I. INTRODUCTION

➢ *Problem Statement*

The Hukaung Valley, once designated as the world's largest tiger reserve, is experiencing a severe decline in tiger populations despite formal conservation efforts. Existing studies highlight habitat loss, illegal resource extraction, and human pressures. However, these challenges are deeply rooted in governance breakdown, including dual governance systems, weak enforcement, transboundary gaps, and the impacts of armed conflict. There remains a lack of integrated understanding of how these governance failures interact to drive the tiger conservation crisis in the region.

➢ *Research Question and Objective*

- *Research Question:*

✓ How does governance breakdown contribute to the tiger conservation crisis in the Hukaung Valley?

- *Research Objective:*

✓ To examine how governance breakdown contributes to the tiger conservation crisis in the Hukaung Valley.

II. METHODOLOGY

This study adopts a qualitative research design to explore how governance breakdown contributes to the tiger conservation crisis in the Hukaung Valley. A qualitative approach is appropriate for capturing complex social, political, and institutional dynamics that cannot be fully understood through quantitative methods.

Primary data were collected through semi-structured interviews. A total of ten participants were deliberately selected based on their knowledge and experience related to local governance, community dynamics, and conservation practices. The sample included two religious leaders (pastors), several youth leaders, and experienced former conservation staffs. This diversity of participants provided multiple perspectives on governance and environmental change in the region.

The interviews focused on key themes such as governance structures, law enforcement, conflict, resource use, and conservation challenges. Open-ended questions allowed participants to share their experiences and observations in depth, particularly regarding how governance and conflict influence environmental outcomes.

Data were analyzed using thematic analysis. Interview responses were systematically reviewed and coded to identify recurring patterns and key themes. The analysis focused on four main categories: dual governance, governance vacuum,

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transboundary governance failures, and the impacts of armed conflict. These themes were then used to interpret how different forms of governance breakdown interact to shape conservation outcomes in the Hukaung Valley.

➢ *Introduction*

Tigers are among the most important apex predators, playing a key role in maintaining the balance of ecosystems. However, their populations have declined dramatically over the past century due to habitat loss, poaching, and human pressures [1] [2] . In Myanmar, particularly in the Hukaung Valley - once known as the world's largest tiger reserve - tiger numbers have dropped to critically low levels despite conservation efforts [3] [4] . This decline is closely linked not only to environmental threats but also to rapid deforestation, land-use change, and increasing human activities in the region [5] .

In recent years, these challenges have been further intensified by armed conflict and governance instability in Kachin State, which have weakened environmental regulation and enforcement [6] [7] . As a result, illegal resource extraction and habitat destruction continue with limited control. While many studies focus on ecological causes of tiger decline, less attention has been given to how governance breakdown shapes these outcomes. Therefore, this study aims to examine how governance breakdown contributes to the tiger conservation crisis in the Hukaung Valley, focusing on issues such as dual governance, governance vacuum, transboundary governance failures, and the impacts of armed conflict.

➢ *Tigers of Kachin*

The tiger is the largest world's big cats. International summit in 2010 announced shocking news that 97% of all wild tigers had disappeared in the last century, with only around 3,000 left alive. Tigers are on the brink of extinction. Tiger, being at the apex of the food chain, can be considered as the indicator of the stability of the eco-system. These big cats serve as a flagship species within South and South-east Asia. Thus, protecting tigers is basically conservation of the entire eco-system. Along with tigers, all other wild animals could also have increased in number in the conservation areas. Tigers are distributed across 13 countries: Bhutan, India, Nepal, China, Russia, Bangladesh, Thailand, Vietnam, Malaysia, Indonesia, Laos, Cambodia, and Myanmar. However, it has recently been declared that tigers are to be extinct in Vietnam, Cambodia, and Laos. [1]

According to Myanmar government and Wildlife Conservation Society estimates, tiger numbers in Myanmar have sharply declined from 3000 tigers in 1980-81 to 1000 in 1996. 2009 research by Lynam et al., states there are 7 to 71 tigers inside a 3,250 km^2 tract of major tiger habitat of Hukaung Valley, where conservation efforts are concentrated in Myanmar. Tiger populations range from 0.2 to 2.2 tigers/100 km^2. [3] A comprehensive two-year survey (2022–2024), led by Dr. Timothy Randhir is presented in Big Cat Rescue that there are only 22 tigers left currently in Myanmar's protected areas. [4]

➢ *Challenges in Hukaung Valley*

Tiger conservation in the Hukaung Valley faces significant and interconnected challenges linked to land-use change, armed conflict, and weak governance. Although the valley was designated as the Hukaung Valley Tiger Reserve in 2004 - once considered the world's largest tiger reserve - deforestation and habitat degradation continue to threaten its ecological integrity. Recent analyses show that forest loss in Kachin State is driven primarily by large-scale agricultural expansion (particularly plantations), illegal logging, gold mining, and infrastructure development, all of which fragment tiger habitat and reduce prey availability [5] [8]. Armed conflict between the Myanmar military and the Kachin Independence Organization (KIO) has further weakened environmental governance, limiting law enforcement capacity and creating conditions where illegal resource extraction can flourish [6]. In addition, poverty and limited livelihood alternatives increase dependence on forest resources, contributing to hunting pressure on both tigers and their prey species. These overlapping political, economic, and ecological pressures illustrate that tiger conservation in Hukaung Valley is not only a biological issue but also deeply shaped by governance instability and land-use conflicts. [7]

➢ *Key Barriers to Effective Tiger Conservation*

Globally, tiger conservation faces a complex set of challenges that undermine efforts to protect and recover these iconic big cats. Habitat loss and fragmentation remain among the most critical threats: expanding agriculture, logging, infrastructure projects, and human settlements have dramatically reduced and broken up tiger landscapes, isolating populations and shrinking their territories, which lowers genetic diversity and disrupts natural behaviors. [2] Poaching and the illegal wildlife trade also pose severe dangers, as tiger skins, bones and other parts are highly valued in traditional medicine and black-market trade, driving organized crime and persistent illegal hunting across Asia. [9] In addition, human–wildlife conflict increases as tigers are forced into closer contact with people when their habitats are diminished, often resulting in retaliatory killings. [2] Conservation efforts must also contend with prey depletion and emerging pressures such as disease threats and climate change, which can further destabilize tiger populations and their ecosystems. [10] These challenges are often worse in areas with 'Weak Governance', where poor regulation and weak enforcement allow habitat destruction, illegal trade, and human-wildlife conflict to continue without control.

➢ *Conservation and Governance Breakdown*

Lund introduces the idea of 'Twilight Institutions' to describe situations where both State and non-State actors share power, especially in areas where government control is weak or unclear. In these settings, authority is not fixed but constantly negotiated at the local level. This makes it difficult to distinguish between formal laws and informal practices, particularly in how land and natural resources are managed. Because governance is overlapping and unclear, rules are not always applied consistently, and different groups may claim control over the same resources. As a result, this situation can create opportunities for unregulated and unsustainable

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resource exploitation. [11] Meagher argues that in a weak state, governance often becomes hybrid. The state and non-state actors jointly exercise authority, resulting in fragmented and uneven systems of control. [12] Maksum shows that after the 2021 military coup in Myanmar, environmental governance became much weaker. This led to increased deforestation and less control over the use of forest resources. He argues that deforestation in Myanmar is not merely an ecological issue but a profound governance crisis. The collapse of central authority allowed many different actors to operate with little oversight. As a result, illegal extraction increased and conservation efforts were seriously weakened. [13]

Tanaka highlights a governance paradox in protected areas, where formal rules and institutions exist but are not effectively implemented in practice. This creates gaps between policy and actual management on the ground. As a result, conservation efforts can be weakened because responsibilities are unclear and enforcement is inconsistent, leading to outcomes similar to a governance vacuum despite the presence of official structures. [14] Brashares et al. show that wildlife declines are often linked to areas with weak governance and social instability, where institutions are unable to effectively manage natural resources. This weak control increases pressure on biodiversity. In such circumstances, limited enforcement and lack of regulation allow overexploitation of wildlife and natural resources, creating conditions that undermines conservation efforts. [15]

Challender and MacMillan argues that poaching is not only a law enforcement issue but is also shaped by broader governance and market factors, including international demand and weak cross-border coordination. These factors make it difficult to control illegal wildlife trade effectively. When countries fail to work together, gaps in transboundary governance allow wildlife trafficking networks to operate across borders, weakening conservation efforts and increasing pressure on endangered species like tigers. [16] Wyatt et al. show that corruption plays a key role in wildlife trafficking across Asia, where officials and authorities may enable illegal activities through bribery and weak oversight. This reduces the effectiveness of law enforcement. In cross-border contexts, corruption creates gaps in governance between countries, allowing trafficking networks to move wildlife products more easily and undermining conservation efforts. [17] Chitakira et al. highlight that effective conservation in transboundary areas depends on strong coordination and cooperation between neighboring countries. Without this, management efforts become fragmented and less effective. Weak transboundary governance creates gaps in policy and implementation, allowing unsustainable land use and resource exploitation to continue across borders, which undermines biodiversity conservation. [18] Wilondja-As-Ngobobo et al. show that shared management of cross-border conservation areas can sometimes create conflicts and coordination problems between countries and institutions. This can reduce the effectiveness of conservation efforts. When responsibilities are unclear and cooperation is weak, gaps in transboundary governance allow resource exploitation and environmental degradation to continue, undermining biodiversity protection. [19]

Daskin and Pringle show that armed conflict leads to serious declines in wildlife populations in protected areas. During conflict, governance becomes weak and enforcement breaks down. As a result, conservation efforts fail and natural resources are more easily exploited. [20] Gaynor et al. explain that armed conflict affects wildlife both directly and indirectly. It can reduce enforcement and increase illegal activities such as poaching and resource extraction. At the same time, conflict can change human behavior and land use, creating new pressures on ecosystems. This weakens conservation efforts and contributes to biodiversity loss. [21]

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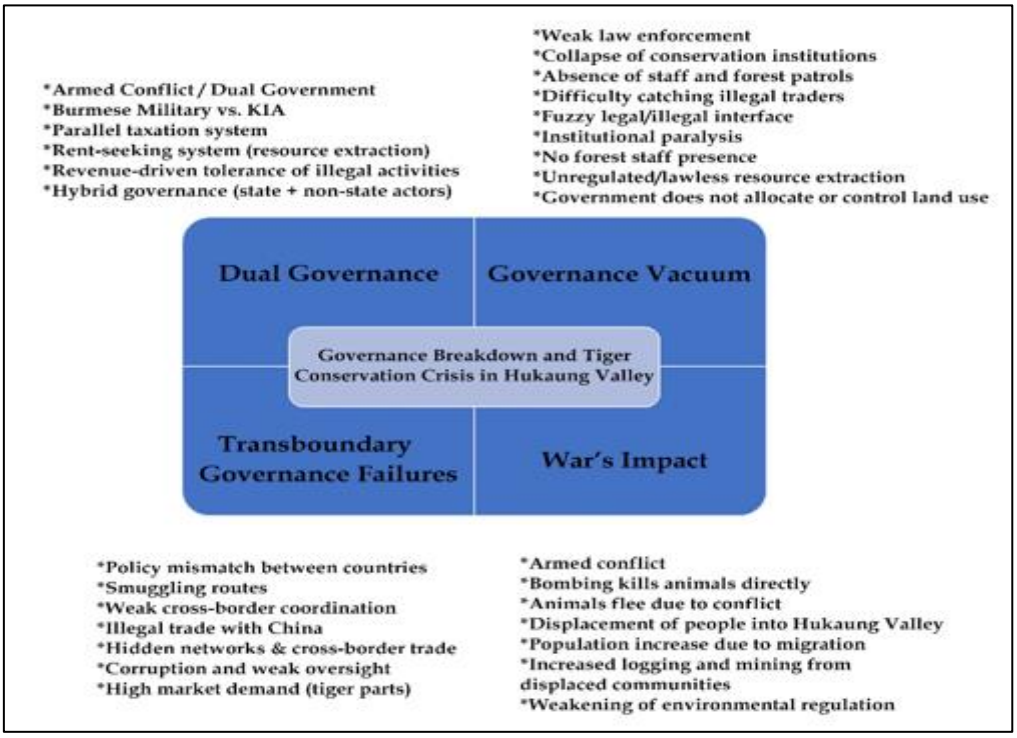

Fig 1 Conceptual Framework of how 'Governance Breakdown' contributes to Tiger Conservation Crisis in Hukaung Valley

III. FINDINGS AND DISCUSSIONS

➢ *Dual Governance*

According to the interview findings, Hukaung Valley is currently under a dual governance system. Authority is shared and contested between state forces and non-state actors, especially the Burmese military and the Kachin Independence Organization. This overlap creates a fragmented system of governance. Rules, authority, and enforcement are often unclear and inconsistent. Both actors operate parallel systems of control. These include taxation and resource management. These systems are mainly used to generate income.

This dual structure in Hukaung Valley fosters a rent-seeking environment in which natural resources such as timber, gold, and wildlife are exploited as sources of income. Instead of enforcing conservation rules, governing actors tolerate and even support illegal activities. This is because these activities bring economic benefits. As a result, environmental governance becomes less important than political and financial interests. This weakens conservation efforts. Unsustainable land use continues to expand. This leads to deforestation, habitat fragmentation, and damage to ecosystems that are essential for tiger survival.

➢ *Governance Vacuum*

Alongside dual governance, the findings show a clear governance vacuum in Hukaung Valley. This is especially visible in remote and conflict-affected areas. Formal conservation policies and protected areas do exist. However, they are not properly implemented. This is due to weak institutional capacity.

Law enforcement is very limited. There are not enough forest staff or patrols and monitoring systems are also absent. As a result, there is little control over how resources are used. This weakness makes it hard to tell what is legal and illegal. Logging, mining, and hunting often take place without proper regulation. In many cases, enforcement is inconsistent or completely absent. There is also no clear authority or accountability. This leads to widespread lawlessness in resource management. As a result, protected areas exist mostly in name only. They are not effectively protected in reality.

The governance vacuum also allows extractive activities to grow quickly. These include illegal logging and gold mining. These activities change land use patterns and speed up habitat destruction. In this situation, conservation does not fail because of missing policies. It fails because policies are not enforced or properly implemented.

➢ *Transboundary Governance Failures*

The findings show serious problems in transboundary governance. This is especially clear along the Myanmar–China border. There is weak coordination between countries. Policies do not match well and this creates gaps in governance. These gaps allow illegal activities to continue. Smuggling routes are widely used and hidden trade networks move timber, gold, and wildlife products across borders.

There is also strong international demand, especially for tiger parts. This increases poaching and illegal trade. At the same time, enforcement is weak. Cross-border cooperation is limited and corruption further reduces control. This makes the illegal activities difficult to stop. Actors can easily move across borders and avoid regulation.

This shows that conservation cannot be solved by one country alone. The problem is regional. Without strong

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cooperation between countries, conservation efforts will remain weak and ineffective.

➢ *War's Impact*

Armed conflict in Kachin State has major impacts on tiger conservation. These impacts are both direct and indirect. Directly, conflict harms wildlife. Bombings kill animals. It can also force them to flee from their habitats. A few interviewees suspect tigers might flee to India due to habitat linkage. Indirect impacts are even more serious. Conflict weakens governance and law enforcement. This makes it easier for illegal activities to grow.

Conflict also causes human displacement. Many people move into Hukaung Valley during the conflicts. These communities depend on forest resources to survive. As a result, logging, mining, and hunting increase. At the same time, there is little regulation or control. This puts more pressure on forests and wildlife.

These factors create a cycle. Conflict weakens governance. Weak governance allows resource exploitation. This leads to habitat loss and tiger decline. Overall, armed conflict is a key driver of environmental damage. It makes conservation much more difficult and less effective.

IV. CONCLUSION

Overall, the findings demonstrate that the decline of tigers in the Hukaung Valley is not solely an ecological issue but a deeply rooted governance crisis. Weak, fragmented, and overlapping authority structures, combined with armed conflict and poor transboundary coordination, have created conditions where conservation policies exist in theory but fail in practice. Without addressing these structural governance failures, efforts to protect tiger populations will remain ineffective. Therefore, sustainable conservation in the Hukaung Valley requires integrated governance reforms, stronger institutional coordination, and long-term peacebuilding strategies that collectively restore effective environmental management.

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