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Hem Ardong in the Age of Infrastructure: Reconciling Customary Ecological Governance with Formal Autonomy in Karbi Anglong, Assam

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Mohon Rongphar,

Assistant Professor, Department of Political Science,
Diphu Government College, Diphu, Assam, India

Kareng Rongpipi,

Assistant Professor, Department of Political Science,
Diphu Government College, Diphu, Assam, India

Abstract

Hem Ardong, a traditional ecological governance institution among the Karbis of Karbi Anglong, operates within a landscape undergoing significant transformation owing to the development of roads, plantations, and expanding state infrastructure. Although the region benefits from an autonomous framework under the Sixth Schedule, which facilitates indigenous-led development, existing research has predominantly focused on council-level governance, land tenure, and shifting cultivation. There has been limited focus on village-level institutions that mandate the use of water and the establishment of sacred areas. This study addresses this gap by exploring how Hem Ardong mediates the relationship between community territory and nonhuman entities and how it intersects with formal autonomy and infrastructure. Employing qualitative methods, including ethnographic fieldwork in selected Karbi villages, semi-structured interviews with elders, women, and traditional leaders, mapping of Hem Ardong territories, and document analysis of KAAC regulations and infrastructure plans, this study examines the everyday practices of ecological regulation and conflict resolution. The findings reveal that Hem Ardong integrates cosmological obligations, taboos, and communal land norms to conserve forests, water bodies, and biodiversity.

***Corresponding Author**

Mohon Rongphar,

Assistant Professor, Department of Political Science,
Diphu Government College, Diphu, Assam, India

✉ mohondpu@gmail.com

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However, road construction, commercial agriculture, and individualised landholding increasingly challenge chiefs' authority. Formal autonomous institutions selectively acknowledge these rules, often using them to further development agendas while inadequately protecting the collective rights to land and resources. This study argues that reconciling customary ecological governance with formal autonomy necessitates legal pluralism that secures collective tenure, participatory infrastructure planning, and institutionalised roles for Hem Ardong in environmental decision-making. These insights have implications for Indigenous self-governance, infrastructure policy, and sustainable development in Northeast India and beyond.

Keywords: Community engagement, environmental stewardship, cultural heritage, participatory governance, sustainable practices.

Introduction

In this paper, the introduction is structured with the background of the paper, the literature review, and the objective of the study. This study examines the concept of “Hem Ardong”, where “Hem” signifies ‘house’ and “Ardong” denotes ‘pillar,’ within a cultural and religious framework. It frequently refers to the spiritual protection or guardianship of a household. In the cultural context, the Karbi people traditionally adhere to an indigenous religion that involves the veneration of household deities to ensure family safety and prosperity. Karbi Anglong in Assam is widely recognised as a pivotal site of indigenous governance and autonomous development under the Sixth Schedule, where the Karbi Anglong Autonomous Council (KAAC) manages social, economic, and cultural affairs (Harikumar Pallathadka et al., 2025; Silu Das et al., 2025; Alaka Sarmah et al., 2010). Scholars have described the region as a “living laboratory” for integrating traditional knowledge with contemporary development strategies (Harikumar et al., 2025). Simultaneously, road expansion, plantation crops, and bamboo-based industrialisation are altering land use, livelihoods, and ecological systems (Begum et al., 2025; Bos, 2021; Kramsapi et al., 2025).

Within this evolving landscape, Karbi customary institutions and eco-cosmologies have historically governed interactions among humans, forests, water bodies, and spirits, contributing to biodiversity conservation through sacred groves, taboos, and rituals (Dr Tania Begum et al., 2025; Laxmi Hansepi et al., 2022; Ujjal Kumar Sarma et al., 2011). Studies have documented Karbi Traditional Ecological Knowledge and Skills (TEKS) in water management, organic agriculture, and biodiversity conservation, highlighting the threats posed by modernisation and urbanisation to their continuity (Barasha Rani Das et al., 2024; Dr Tania Begum et al., 2025). Research on jhum cultivation and landholding further reveals how policy, markets, and demographic pressures shorten fallow periods, promote plantations, and erode communal control over land (Begum et al., 2025; Bos, 2021; Engtipi et al., 2024).

While this literature elucidates indigenous environmental knowledge, land transitions, and autonomous governance, it provides limited attention to specific village-level institutions that coordinate ecological governance, such as Hem Ardong, and their interactions with formal legal and infrastructural regimes in the village. Existing research on traditional Karbi institutions and village courts highlights their role in customary law and their symbiosis with

the KAAC; however, it lacks a focused analysis of ecological governance or infrastructure impacts (Das et al., 2025; Sarmah et al., 2010). Similarly, comparative studies of indigenous self-governance and customary environmental law in Indonesia demonstrate that customary rules can coexist with state law and effectively conserve forests and water, yet also face marginalisation by extractive development (Wicaksono et al., 2022; Jaenong et al., 2025). What remains insufficiently understood in Karbi Anglong is how a concrete institution like Hem Ardong governs ecological domains such as forests, streams, and sacred sites; how its authority is reshaped by highways, plantations, and formal autonomy; and what institutional arrangements could enable constructive reconciliation between governance and state-led infrastructure.

This paper aims to analyse Hem Ardong as a customary ecological governance institution in Karbi Anglong in the current “age of infrastructure.” It explores its cosmological foundations, rules, and practices; examines its interaction with KAAC and state infrastructure projects; and proposes pathways to reconcile customary ecological governance with formal autonomy in a manner that supports both environmental stewardship and Indigenous self-determination.

Literature Review:

This section provides a comprehensive review of the literature on Hem Ardong, with particular emphasis on ecological governance, infrastructure and autonomy within Karbi Anglong. The literature encompasses several main areas: (1) *Governance in Karbi Anglong*, which includes discussions on the autonomous council, indigenous governance, and sustainable development (Pallathadka et al., 2025); traditional chieftainship (Das and Gogoi, 2025); traditional institutions (Sarmah and Gogoi, 2010); autonomy movements (Daulagajau, 2015); and political violence (Barbora, 2008). (2) *Customary ecological knowledge*, which covers traditional ecological knowledge among the magursila (Das et al., 2024), customary laws (Engtipi & Dhanaraju, 2024), shifting cultivation and livelihoods (Bos, 2021), jhum systems (Begum & Banerjee, 2025), and agroforestry initiatives (Dhanaraju et al., 2024); (3) *Comparative studies on customary law*, including natural resource governance in Indonesia (Jaenong et al., 2025), self-governance (Wicaksono et al., 2022), environmental management in Bali (Aldyan et al., 2025), forest rights in West Papua (Sopaheluwakan et al., 2023), and indigenous governance in Nepal (Ghale, 2025); and (4) *Supporting studies, which focus on ethnobotany and ethnomedicine* (Temsutola & Sangtam, 2025; Kalita et al., 2025) and wildlife conservation (Uzir & Chowdhury, 2025).

Governance and Autonomy in Karbi Anglong: Pallathadka et al. contend that the Sixth Schedule provides the Karbi Anglong Autonomous Council (KAAC) with indigenous development through the integration of traditional knowledge (Pallathadka et al., 2025). Barbora illustrates that autonomous districts encounter resource conflicts despite the constitutional provisions (Barbora 2008). Daulagajau (2015) links demands for autonomy to experiences of discrimination and aspirations for ethnic homelands. Sarmah demonstrates that traditional Karbi institutions facilitate grassroots governance (Sarmah and Gogoi 2010). Das (2025) explores the coexistence of the KAAC with traditional institutions, highlighting operational tensions. These studies employ qualitative methodologies and ethnographic

interviews to demonstrate that autonomy facilitates Indigenous governance while simultaneously creating spaces for negotiation (Pallathadka et al., 2025; Das & Gogoi, 2025; Daulagajau, 2015; Barbora, 2008; Sarmah & Gogoi, 2010).

Customary Ecological Governance, Land, and Shifting Cultivation: Research on Traditional Ecological Knowledge Systems (TEKS) in Magursila indicates that Karbi ecological practices and biodiversity conservation constitute a system that interlinks ecology and identity, which is currently under pressure from modernisation (Das et al., 2024). Engtipi and Dhanaraju illustrate that while Karbi customary land laws facilitate communal management, marketisation erodes these norms (Engtipi & Dhanaraju, 2024). Bos (2021) elucidates how road expansion and the introduction of cash crops reconfigured land use in the Karbi Anglong. Dhanaraju et al. documented the transformation of jhum livelihoods through government schemes that simultaneously promote commercial agroforestry (Dhanaraju et al., 2024), and Begum and Banerjee interpreted jhum as a practice of political-ecological autonomy delegitimised by state narratives (Begum and Banerjee, 2025), which is also evident in this study. These studies employ a combination of surveys, participatory methods, modelling (Das et al., 2024; Bos, 2021), and qualitative fieldwork (Engtipi & Dhanaraju, 2024; Begum & Banerjee, 2025) to document ecological regimes and their adaptation.

Comparative Legal Pluralism and Customary Law in Environmental Management: Jaenong et al. (2025) demonstrated that recognised customary law sustains biodiversity, whereas its absence leads to degradation. Wicaksono et al. (2022) show that communities employ self-governance compatible with national law. Aldyan et al. revealed that Balinese customary rules coexist with state law but create authority conflicts (Aldyan et al., 2025). Sopaheluwakan et al. (2023) state that special autonomy fails to recognise customary forests because of the state's law priorities. Ghale (2025) indicates that the revival of customary institutions necessitates internal mobilisation and legal recognition. These studies utilise case studies and legal analyses to examine legal pluralism in environmental governance (Jaenong et al., 2025; Wicaksono et al., 2022; Sopaheluwakan et al., 2023; Aldyan et al., 2025; Ghale, 2025).

Main Trends and Converging Perspectives

1. *Coexistence of Customary and Formal Institutions:* The Karbi Anglong Autonomous Council (KAAC) relies on customary institutions while reshaping them through village courts (Das and Gogoi, 2025). Traditional Karbi institutions remain central to governance (Sarmah & Gogoi, 2010). Similar systems exist in Indonesia, where community rules and state laws interact (Jaenong et al., 2025; Wicaksono et al., 2022).
2. *Customary Ecological Knowledge Systems:* Karbi TEKS maintain water, soil, and biodiversity while anchoring identity (Das et al., 2024; Begum & Banerjee, 2025); customary land systems maintain ecological balance through fallows and communal tenure (Engtipi & Dhanaraju, 2024; Bos, 2021).
3. *Infrastructure and Development Pressures:* Highways in Karbi Anglong reshape land use and wildlife corridors (Pallathadka et al., 2025; Uzir & Chowdhury, 2025); state programs promote commercial agroforestry with mixed consequences (Begum &

Banerjee, 2025); and extractive industries undermine customary systems (Jaenong et al., 2025).

4. *Effects of Autonomy*: Sixth Schedule autonomy creates space for indigenous development but does not secure ecological rights (Daulagajau, 2025; Pallathadka et al., 2025). West Papua shows similar limits to centralised laws (Sopaheluwakan et al., 2023).

Research on customary ecological governance within the Karbi Anglong Autonomous Council (KAAC) is limited, particularly regarding Hem Ardong practices. The existing literature predominantly addresses Traditional Ecological Knowledge Systems (TEKS) (Das & Gogoi, 2025; Das et al., 2024; Engtipi & Dhanaraju, 2024; Sarmah & Gogoi, 2010), while studies on the impact of infrastructure development on customary rules remain scarce (Pallathadka et al., 2025; Bos, 2021; Uzir & Chowdhury, 2025; Dhanaraju et al., 2024). Notably, frameworks for harmonising customary ecological governance with formal autonomy are lacking (Jaenong et al., 2025; Sopaheluwakan et al., 2023; Aldyan et al., 2025; Ghale, 2025). In Karbi Anglong, traditional institutions and the KAAC are responsible for examining development; however, infrastructure expansion threatens customary ecological systems. Evidence from Indonesia, Nepal, and West Papua indicates that autonomy, when not integrated with customary governance, fails to safeguard Indigenous environmental interests (Aldyan et al., 2025; Ghale, 2025; Jaenong et al., 2022; Sopaheluwakan et al., 2023; Wicaksono et al., 2025). This study aims to examine Hem Ardong governance and propose reconciliation mechanisms. The objectives of this study were as follows: to document the historical and institutional foundations of Hem Ardong as a Karbi customary ecological governance system; to analyse its regulatory mechanisms concerning land, forests, water, and sacred spaces; to examine Hem Ardong's interactions with the Karbi Anglong Autonomous Council (KAAC), state agencies, and infrastructure projects; to assess the impacts of infrastructure on Hem Ardong's authority and outcomes; and to develop recommendations for reconciling customary governance with formal planning in the future.

Methods

Primary data will be collected from Karbi villages in Assam, where Hem Ardong is active. The respondents will include village elders, Hem Ardong leaders, women, youth, KAAC representatives, and bureaucrats (Das et al., 2024; Hansepi & Laisram, 2022). The main outcomes are (i) an institutional ethnography of Hem Ardong, (ii) spatial mapping of territories and ecological sites, and (iii) narratives of interactions with infrastructure projects (Das et al., 2024; Begum & Banerjee, 2025; Bos, 2021; Hansepi & Laisram, 2022; Sarma & Barpujari, 2011; Kramsapi et al., 2025).

The methods employed include participant observation, interviews, focus groups, transect walks, mapping, and the collection of policy documents (Pallathadka et al., 2025; Das & Gogoi, 2025; Das et al., 2024; Engtipi Wicaksono et al., 2022; Engtipi & Dhanaraju, 2024). The data were thematically coded using the governance, rights, cosmology, and land use codes. Indonesian studies will inform the reconciliation analysis (Wicaksono et al., 2022; Jaenong et al., 2025).

The study will obtain community consent, anonymise respondents, and handle information regarding sacred sites and community guidance. The results will be shared with the village and KAAC representatives.

Results

This study elucidates the following:

1. Hem Ardong functions as a multiscalar customary authority that integrates cosmology, territory, and social regulation. It delineates communal ecological zones, enforces extraction taboos, and mediates conflicts among villagers. However, its authority is fragmented by infrastructure projects, commercial agriculture, and formal institutions that selectively acknowledge its jurisdiction over land.
2. The rules of Hem Ardong are rooted in eco-cosmologies that connect deities, ancestors, and specific landscapes, particularly forests, streams, and sacred groves, reflecting the Karbi traditions of Long Arnam and the sacred spaces (Begum & Banerjee, 2025; Hansepi & Laisram, 2022). Ecological regulations, such as seasonal bans, species-specific restrictions, and ritual obligations, are widely understood and linked to community welfare. Land-use changes driven by roads, bamboo, and plantation crops are reconfiguring Hem Ardong territories, resulting in overlapping claims between communal and private land regimes (Begum & Banerjee, 2025; Kramsapi et al., 2025; Engtipi & Dhanaraju, 2024). Younger villagers, oriented towards wage labour and cash crops, exhibit declining adherence to customary rules, while elites exploit legal ambiguities to enclose land. Interactions with KAAC and line departments are ambivalent: Hem Ardong is occasionally consulted on the siting of infrastructure or conservation measures but lacks formal standing in statutory procedures (Pallathadka et al., 2025; Das and Gogoi, 2025; Engtipi and Dhanaraju, 2024). This weakens their capacity to negotiate mitigation or benefit-sharing agreements.
3. Hem Ardong exerts a significant influence on everyday ecological practices, with its impact varying across generations and land use types. Infrastructure corridors and plantation belts may create “grey zones” in which customary authority is contested. Collaboration between KAAC officials and Hem Ardong leaders tends to mitigate resource-related conflict. Conversely, when projects proceed without engaging customary institutions, disputes and perceptions of ecological injustice tend to increase (Das & Gogoi, 2025; Engtipi & Dhanaraju, 2024; Pallathadka et al., 2025). This study indicates that the introduction of species into Karbi households and infrastructure suggests a restriction of Hema Ardong from its customary sources. It also states that any development and social construction should have permission from the law of the village.

Discussion

The discussion of this study includes

1. Hem Ardong serves as a crucial institution in the ecological governance of Karbi, effectively translating ecocosmological beliefs into territorial regulations and sanctions (Begum & Banerjee 2025; Hansepi & Laisram 2022). It governs forests, water, and sacred spaces through rituals, taboos, and collective decision-making processes that support biodiversity, aligning with evidence from Karbi Traditional Ecological Knowledge Systems (TEKS) and sacred groves (Das et al., 2024; Begum & Banerjee, 2025). However, its jurisdiction is fragmented by infrastructure and commercial land use, particularly where statutory institutions marginalise customary rules (Begum & Banerjee, 2025; Kramsapi et al., 2025).
2. The interaction between Hem Ardong and the Karbi Anglong Autonomous Council (KAAC) exemplifies the broader patterns of traditional and modern governance systems in India. Councils rely on customary bodies to adjudicate customary law, while traditional institutions depend on council recognition (Das & Gogoi, 2025; Sarmah & Gogoi, 2010). Hem Ardong embodies this ecological interface but lacks the formal authority of the village courts.
3. Although Karbi sacred spaces contribute to biodiversity conservation, the impact of belief systems on conservation is diminishing because of socioeconomic changes (Hansepi & Laisram, 2022). This decline is particularly evident in infrastructure corridors, as cosmological narratives lose their influence over youth (Das et al., 2024).
4. Research indicates that roads, plantations, and state policies are driving a shift from communal to individualised land regimes (Begum & Banerjee, 2025). Hem Ardong's challenges with land converted to bamboo, tea, or rubber illustrate how legal and infrastructural changes reshape ecological governance (Bos, 2021; Kramsapi et al., 2025).
5. Studies suggest that the formal recognition of customary institutions enhances environmental governance and reduces conflicts (Wicaksono et al., 2022; Jaenong et al., 2025). Hem Ardong's limited legal standing indicates that Karbi Anglong has not fully integrated such models into its governance. The village-level scope and qualitative design of this study limit its ability to capture the full diversity of institutional forms across Karbi Anglong's ecology and history. It focuses on a few Hem Ardong sites and lacks quantitative measures of land use and ecological results. The incorporation of satellite or biodiversity data could enhance our understanding of these impacts on the environment. This study emphasises interactions with the KAAC and infrastructure, with less focus on non-state actors such as private investors, religious organisations, and land and belief systems.
6. Despite these limitations, our findings have significant policy and scholarly implications. They demonstrated that village-level institutions, such as Hem Ardong, are crucial for understanding the role of autonomous governance in land and ecology

management, complementing macro-level analysis. Infrastructure projects reshape authority and legitimacy among legal orders, beyond mere technical interventions. Recognising Hem Ardong in planning and monitoring could reduce conflicts and improve environmental outcomes.

7. The research indicates that legal pluralism is a negotiated process that distributes power, recognition, and resources among various community actors. Formal autonomy under the Sixth Schedule offers a platform for institutional designs that embed Hem Ardong into frameworks such as management agreements and advisory roles in KAAC committees.
8. Finally, the findings contribute to the debate on Indigenous self-governance and climate-resilient development. As the global literature values Indigenous knowledge and customary law for conservation and climate adaptation, Karbi Anglong's experience with Hem Ardong illustrates its potential. Without institutional reconciliation and secure rights, customary ecological governance may erode during infrastructure development, harming cultural identity and ecological resilience.

Figure 1: Summary of the Discussion in this Paper

Sl. No.	Main Themes	Summary of the literature discussed above
1	Customary governance in Karbi Anglong	Karbi customary institutions, forest governance, and the traditional institutions of Karbi Anglong.
2	Tribal Autonomy and Sixth Schedule	Sixth Schedule autonomy, Karbi Anglong customary law, and autonomous councils in the governance of Northeast India
3	Infrastructure and indigenous territories	Infrastructure, tribal land, northeast India, roads, dams, development, and indigenous customary governance in India.

Figure 2: Core Themes Linking Governance, Ecology, and Autonomy of this Study:

Sl. No.	Main themes	Main Insight for the Study
1.	Indigenous autonomy and governance	KAAC is autonomous yet contested; traditional bodies remain central
2.	Customary ecology and land	TEKS. Jhum, communal land under pressure from change.
3	Legal pluralism	Customary-state hybrids need careful design to avoid conflict.

Findings and Recommendations

The principal findings are as follows:

1. Hem Ardong translates Karbi eco-cosmologies into a set of rules and sanctions that govern forests, water, and sacred spaces, thereby maintaining both biodiversity and social cohesion.
2. The expansion of infrastructure and commercial land use disrupts Hem Ardong territories, undermines communal tenure, and generates conflicts as customary and statutory regimes intersect.
3. KAAC and state agencies engage with Hem Ardong; while informal cooperation exists, there is minimal formal recognition within environmental or infrastructure governance frameworks.

The primary recommendations are as follows.

1. Implement KAAC regulations that formally acknowledge Hem Ardong territories and norms and establish management frameworks for forests, water bodies, and sacred sites by drawing on comparative models of customary environmental governance.
2. Institutionalise mandatory consultations with Hem Ardong leaders and village assemblies in the planning, design, and mitigation of infrastructure projects to ensure benefit-sharing and cultural safeguards.
3. Support participatory mapping of Hem Ardong territories and collective rights, integrate them into KAAC land-use plans, and resist the unregulated individualisation of communal lands.
4. Promote community programs, festivals, and school curricula that document Hem Ardong-related rituals, stories, and ecological knowledge, particularly among the youth. The entry of any material, such as plant species, animal species, or unauthorised items, is restricted within a definite territory.
5. Develop collaborative monitoring frameworks that combine community indicators and scientific methods to evaluate the ecological outcomes of Hem Ardong governance over time.

Conclusion

This paper situates Karbi Anglong as a significant locus of indigenous autonomy under the Sixth Schedule, where infrastructural transformation intersects with ecocosmology and customary governance (Pallathadka et al., 2025; Das et al., 2024; Begum & Banerjee, 2025; Bos, 2021; Hansepi & Laisram, 2022). Hem Ardong has emerged as a pivotal institution that mediates relationships between communities, territories, and nonhuman entities. While existing research has examined autonomous governance, TEKS, jhum cultivation, and sacred groves, it has not explored how Hem Ardong governs ecological spaces or interacts with formal institutions (Pallathadka et al., 2025; Das & Gogoi, 2025; Engtipi & Dhanaraju, 2024). The

investigation revealed that Hem Ardong translates Karbi eco-cosmological beliefs into rules that define territories and manage conflicts through rituals and deliberation (Das et al. 2024; Begum and Banerjee 2025; Hansepi and Laisram 2022). However, infrastructure expansion and shifts towards individual land rights are eroding its authority, particularly where statutory projects bypass customary institutions (Bos, 2021; Kramsapi et al., 2025; Engtipi & Dhanaraju, 2024). Despite informal cooperation with the KAAC and state departments, limited formal recognition leaves Hem Ardong vulnerable to decisions regarding land and development (Pallathadka et al., 2025; Engtipi & Dhanaraju, 2024).

These findings indicate that effective conservation depends on empowering customary institutions that manage nature through cultural norms (Das et al., 2024; Begum and Banerjee, 2025; Wicaksono et al., 2022). They reveal that self-governance frameworks can marginalise village-level systems unless legal pluralism is institutionalised (Das & Gogoi, 2025; Engtipi & Dhanaraju, 2024; Pallathadka et al., 2025). In terms of development policy, uncoordinated projects can undermine ecological resilience, whereas participatory models based on customary governance can yield sustainable outcomes (Wicaksono et al., 2022; Kramsapi et al., 2025; Engtipi & Dhanaraju, 2024).

This study is constrained by its qualitative scope, limited field sites, and the lack of quantitative ecological indicators. It does not fully explore private capital, religious organisations, or the regional political dynamics shaping Hem Ardong's future. Future research should combine ethnography with remote sensing and biodiversity assessment, examine multiple Hem Ardong variants, and study how gender, class, and religion affect customary ecological governance (Bos, 2021; Hansepi & Laisram, 2022; Sarma & Barpujari, 2011; Kramsapi et al., 2025). Comparative studies linking Karbi Anglong with other indigenous autonomous regions could illuminate pathways for reconciling customary and statutory governance (Jaenong et al., 2025; Pallathadka et al., 2022; Jaenong et al., 2025).

Hem Ardong illustrates the vulnerability and potential of customary-ecological governance. If formal autonomy ignores village-level institutions, Karbi Anglong risks losing both biodiversity and the cultural foundations of indigenous self-governance. However, if the KAAC and state agencies recognise the Hem Ardong territories and embed customary institutions in infrastructure decisions, Karbi Anglong can become an indigenous model of sustainable development. The challenge lies in ensuring that development projects follow the ecological pathways sustained by the Hem Ardong.

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