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# BEYOND COASE: INSTITUTIONAL FAILURE AND THE CONFLICT OVER SAND MINING IN THE THOUBAL RIVER, MANIPUR

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## ABSTRACT

The Thoubal River in Manipur, Northeast India, has long supported livelihoods and ecosystem services through its various ecosystem services such as provisioning, cultural as well as regulatory services. However, recent hydrological disruptions, enhanced by the construction of the Mapithel (Thoubal Multipurpose Project) Dam and the increase in the demand for construction materials, have intensified mechanized sand mining in the river's upstream sections. This has led to ecological degradation and triggered a growing conflict with downstream communities. This paper examines whether the Coase Theorem can explain or resolve this conflict. This theorem assumes that clearly defined property rights and low transaction costs can resolve externalities through private bargaining. Drawing on field interviews, policy analysis, and stakeholder mapping, the study finds that key Coasean conditions such as ownership clarity, enforceability, and low-cost bargaining are absent due to institutional failure, elite capture, and land ownership ambiguities. The paper argues that the informal privatization of a public resource in a context of weak governance invalidates the Coasean framework. It proposes a multi-stakeholder river basin management framework, ecological taxation, and livelihood transition policies as viable alternatives for conflict resolution and sustainable river governance. This case contributes to broader debates on common-pool resource management, environmental justice, and institutional design in the Global South.

**Keywords:** Institutional, Conflict, Thoubal, Sand Mining, River

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## 1. INTRODUCTION

Rivers are not only vital ecological corridors but also contested socio-economic spaces, especially in regions undergoing rapid environmental and infrastructural change(Swyngedouw, 1999). The Thoubal River, which originates in the Huimi Hills of Ukhrul district in Manipur, Northeast India, historically served as a key natural asset for both upstream and downstream communities. It has long supported diverse ecosystem services—most notably, provisioning services such as irrigation, different floras and faunas, fishes and the extraction of sand and gravel. These natural resources have sustained the livelihoods of thousands of households over generations.

However, the commissioning of the Thoubal Multipurpose Dam or locally known as Mapithel Dam has significantly disrupted the Thoubal River's ecological balance (Renuka, 2019). The commissioning of the dam has altered the natural hydrological regime, hindering the monsoon-driven sediment replenishment which once sustained the livelihood sources of the riparian communities. This lead to the declining sediment availability of the sand and gravel in the Thoubal river bed. On the other hand, there is increasing construction activities driven by government infrastructural growth as

well as private constructions in the state. In response to the declining sediment availability and rising sand demand driven by regional construction booms, upstream miners have increasingly turned to mechanized and in-stream extraction techniques. These practices have tremendously amplified ecological stress: reducing water flows, degrading water quality, and increasing turbidity—all of which compromise the river's health and usability (Padmalal & Maya, 2014).

The resulting externalities have disproportionately affected downstream communities, who now face reduced access to clean water and degraded river ecosystems. In protest, these communities have filed public interest litigations, prompting the High Court of Manipur to impose a legal ban on sand mining(The Indian Express, 2019). Despite judicial intervention, illegal extraction persists, often under the protection of local political actors and with minimal enforcement by regulatory bodies—characteristics common in institutional voids prevalent in the Global South (Agrawal, 2001; Baland & Platteau, 1996; Ostrom, 1990)

Complicating matters further is the ambiguity of land ownership along the river. As the Thoubal river has significantly shifted the course over the time, privately owned lands have become part of the riverbed. Many landowners claim continued ownership over submerged or encroached lands and lease them for sand mining. This creates a public-private ownership dilemma, where a common-pool resource is informally appropriated as private property. As a result, the resource is overexploited, illustrating the classic "tragedy of the commons" and ultimately undermining regulatory oversight and public accountability (Bromley, 1991; Hardin, 1968)

This paper adopts the Coase Theorem as a theoretical basis to examine the dynamics of the Thoubal River conflict. Ronald Coase (1960) posited that in the presence of well-defined property rights and low transaction costs, externalities could be resolved through voluntary bargaining without the need for government intervention. However, subsequent empirical studies suggest that such conditions rarely exist in complex, real-world scenarios, particularly in developing economies where power asymmetries, weak institutions, and high enforcement costs prevail (Vatn, 2005; Hanna, Folke, & Mäler, 1996).

The central research question of this study is: To what extent can the Thoubal River conflict between upstream sand miners and downstream communities be explained through the Coasean framework? In addressing this question, the paper also explores potential institutional innovations, including ecological taxation, that can enable conflict resolution and river restoration while securing the livelihoods of those dependent on sand extraction.

The rest of this paper is structured as follows. Section 2 presents a literature review on the Coase Theorem and its relevance to environmental resource conflicts. Section 3 outlines the research methodology and context. Section 4 presents the empirical findings from the Thoubal River case. Section 5 discusses policy implications, and Section 6 concludes the study with reflections on institutional design and river basin governance.

## 2. LITERATURE REVIEW

The governance of common-pool resources (CPRs) such as rivers has long attracted scholarly attention due to the complex interactions between collective sustainability and human activities leading to conflicts. Two foundational paradigms dominate this type of studies i.e, the Coasean framework emphasizing private bargaining under defined rights, and the institutionalist perspective, which critiques such idealized conditions in real-world CPR settings.

## 2.1. THE COASE THEOREM AND ITS ENVIRONMENTAL APPLICATIONS

The Coase Theorem, as introduced by Ronald Coase, argues that in the presence of clearly defined property rights and negligible transaction costs, externalities can be resolved through voluntary negotiation between the involved stakeholders. In theory, this results in efficient outcomes without the hurdle of letting the government interventions. This has beenwidely studied in environmental economics, particularly in proposing market-based solutions to pollution, land and other resource conflicts (Tietenberg & Lewis, 2018)

However, various studies found that assumptions of the Coase Theorem are rarely met in the contexts related to environmental concerns. Transaction costs in CPR disputes are found relatively high due to power asymmetries, legal complexities, and dispersed stakeholders. Furthermore, bargaining is complicated by conflicting values, asymmetric information, and weak enforcement of agreements (Vatn, 2006).These challenges are particularly prevalent in the Global South, where legal institutions are less powerful or selectively enforced (Baland & Platteau,1996).

## 2.2. INSTITUTIONAL FAILURE AND CPR MISMANAGEMENT

Critiquing the Coasean bargaining, scholars like Ostrom (1990)and Agrawal (2001) have emphasized the role of institutions—both formal (laws, courts, administrative bodies) and informal (customary norms, local associations)—in shaping resource governance outcomes. Ostrom's empirical work proves that CPR management can be sustainable and is possible through locally evolved institutions, given that there is a proper conflict resolution spaces and efficient monitoring.

However, when institutions are weak, absent, or captured, CPRs are vulnerable to the risk of being overexploited and captured by powerful elites. This condition, known as institutional failure, is often characterized by ambiguous property rights, low enforcement capacity, and infighting stakeholders. In such scenarios, resources that are legally public resources may be de facto appropriated by people with powerful backing and connections resulting in unsanctioned privatisation and degradation (Bromley, 1991; Cleaver, 2017).

In the Indian context, institutional failure has been documented in several CPR sectors, including forests (Sundar, 2000), groundwater (Shah, 2010), and rivers (Lele & Menon, 2014). These studies explains how weak enforcement, local political interests, and absence of credible negotiation platforms leads to resource conflicts and environmental degradation.

## 2.3. THE PUBLIC-PRIVATE OWNERSHIP DILEMMA

A number of recent studies address scenarios where public resources are illegally or informally privatized in the absence of regulatory oversight. Unlike formal privatization by the state through institutional reforms, this de facto appropriation arises from enforcement gaps, institutional ambiguity, or legal pluralism(Bakker, 2004). In river systems, this has led to conflicts over water rights, pollution, and extraction where public goods like riverbeds or floodplains are leased or occupied by private actors without legal sanction (Rahim et al., 2024).

This literature is particularly relevant to the Thoubal River case, where sand miners most of them are forced to earn livelihoods, often backed by rich contractors. There is a phenomenon of exploiting the land ownership ambiguities and enforcement gaps to convert public riverbeds into private extraction zones. The result is a public-private ownership dilemma that undermines environmental sustainability in such a fragile ecosystem.

## 3. STUDY AREA AND METHODOLOGY

## 3.1. STUDY AREA: THE THOUBAL RIVER BASIN

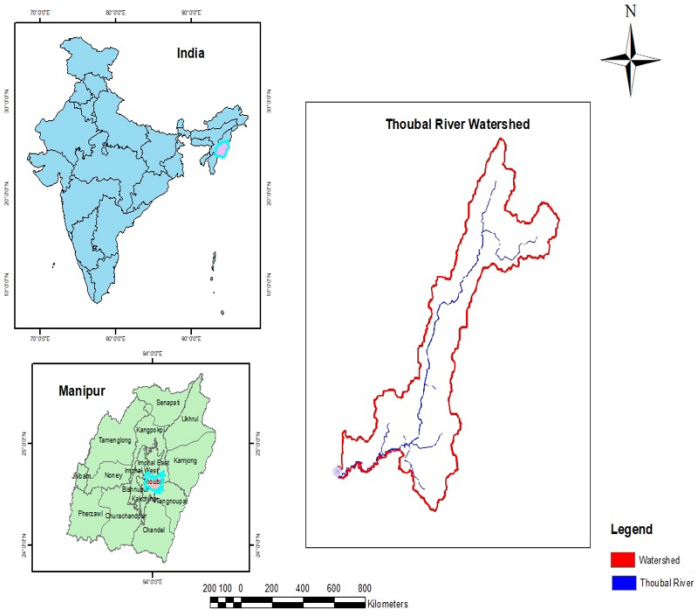


**Figure 1** Location map of the study area.

The Thoubal River originates in the Huimi Hills of Ukhrul district, located in the eastern hill ranges of Manipur, Northeast India. Flowing westward, the river traverses through two valley districts- Imphal East and Thoubal, later joining with the Imphal River at Irong Ichil. The river basin is a part of the Imphal River basin and the larger Chindwin River system of Northeast India and Myanmar. From its source, the river follows southward, meandering through diverse topographical landscapes, including steep hills, narrow valleys, rural and urban settlements, extensive floodplains, and agricultural fields. The river exhibits a meandering course of roughly 130 km before merging with the Imphal River at Irong Ichil. Roughly midway, where the elevation recedes, the river is dammed by the Thoubal Multipurpose Project (Mapithel Dam) at Maphou Village. Of its total length, about 70 km runs through steep hilly areas from Huimi to Nungbrang, with the remaining 65.86 km passing through relatively flat terrain and finally joins the Imphal River at Irong Ichil (Hijam, 2002; Rahaman, 2024).

The river has historically played a central role in the ecological and economic life of the region, providing water for irrigation, drinking, and small-scale fisheries, as well as sand and gravel used in construction industries.

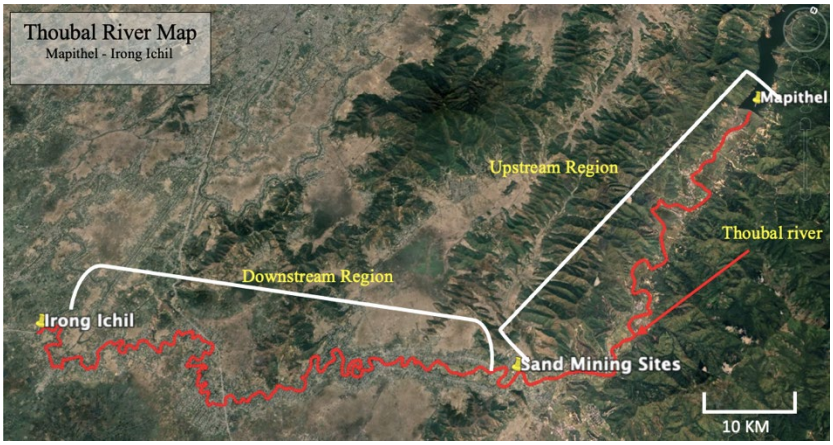


**Figure 2** Google earth image of the study area, the zones are highlighted accordingly.

The upper reaches of the Thoubal River are predominantly inhabited by tribal communities engaged in subsistence agriculture and sand extraction, while the lower valley and downstream areas are densely settled with Meitei and Pangal (Muslim) communities. In recent decades, this socio-ecological system has been destabilized by multiple drivers. The construction of the Mapithel Dam (also known as Thoubal Multipurpose Project) has altered the river's hydrological regime and sediment flow. Exacerbated by this factor and with the increased demand of sand and gravel in the state, sand mining activities which was once relied on manual and primitive techniques had been escalated, often using heavy machines and excavators. Downstream communities have reported reduced water quality, increased pollution, and riverbank erosion, resulting in livelihood and ecological stress. Despite a judicial ban on sand mining by the High Court of Manipur, legal extraction continues due to weak enforcement, high unemployment, ambiguous ownership complexities and unholy political backings.

This geographic and socio-political context offers a microcosm for examining institutional failure and contested closer common-pool resources.

## 3.2. RESEARCH DESIGN AND DATA SOURCES

This study adopts a qualitative method approach. The qualitative method is supported by stakeholder mapping, semi-structured interviews, and document review.. The goal is to assess the applicability of the Coasean framework in the presence of institutional failure and to explore the potential for alternative governance mechanisms.

**Key Methods and Tools:**

**1) Stakeholder Mapping**

- Identification and classification of key actors:

- Upstream sand miners (individual extractors and machine operators)
- Downstream communities (farmers, households, local NGOs)
- Regulatory institutions (Water Resources Department, Pollution Control Board)
- Local political elites and landowners

**2) Semi-Structured Interviews**

- Conducted with:
- 12 upstream sand miners
- 18 downstream residents (including community leaders and members of the Thoubal River Protection Committee)
- Local government officials and NGO workers
- Focused on perceptions of river degradation, access rights, experiences with enforcement, and willingness to cooperate

**3) Field Observations**

- Ground visits to sand mining hotspots and degraded downstream river sections
- Documentation of equipment use, erosion patterns, and evidence of pollution

**4) Document and Legal Review**

- Analysis of the High Court judgment (2019), state mining policies, lease agreements (where available), and NGO petitions
- Review of land records to assess ownership disputes in encroached riverbeds

**Figure 4** Thoubal River in the downstream

**Figure 5** Sand Mining Sites in the midstream section of the river

## 3.3. ANALYTICAL FRAMEWORK

The analysis applies a theory-testing framework grounded in the Coase Theorem and critiques from institutional economics. The study examines whether the core assumptions of Coase—clearly defined property rights, low transaction costs, and enforceable contracts—are present in this setting. The following indicators guide the evaluation:

| Coasean Assumption | Operational Indicator |
|---|---|
| Defined property rights | Clarity of ownership over riverbeds and sand deposits |
| Low transaction costs | Evidence of past/future bargaining, forums for negotiation |
| Enforceability | Legal and institutional capacity to uphold agreements |
| Efficient outcome possible | Balance between ecological restoration and livelihoods |

By systematically testing these assumptions, the study assesses whether Coasean bargaining is feasible and what institutional innovations are required to support sustainable and equitable river governance.

## 4. FINDINGS AND ANALYSIS

This section presents empirical findings from primary fieldwork survey conducted in the Thoubal River basin, focusing on four key Coasean conditions: property rights clarity, transaction costs, bargaining behavior, and outcome efficiency. The finding from the study reveals that these conditions are either weakly met or absent, undermining the theoretical applicability of the Coase framework in this context.

## 4.1. AMBIGUITY IN PROPERTY RIGHTS AND LAND OWNERSHIP

A foundational assumption of the Coase Theorem is the existence of clearly defined and enforceable property rights. In the case of the Thoubal River, property rights over riverbeds and adjoining land are highly ambiguous due to two overlapping dynamics:

Shifting River Course: Several interviews with upstream sand miners and landowners in the study revealed that the Thoubal River had changed its course over the last few decades significantly, displacing hundreds of households. As a result, privately owned lands are sometimes submerged or overtaken by the river, creating legal confusion over whether the land remains private or becomes part of the public waterway. Although according to Public Trust Doctrine (PTD) and many landmark judgements by the courts of the country emphasized the supremacy of environmental rights over private rights, invoking Articles 21 and 48A of the Constitution (Right to Life and environmental protection), yet these submerged lands still continued to be owned privately by the respective owners.

**Privatized Use of Public Resources:** In multiple instances, landowners continue to claim ownership of encroached riverbeds and have leased them to sand mining contractors. This leads to the de facto privatization of a common-pool resource that is legally a public good (Interview, Sand Miner 02, March 2023). Government authorities have not issued clear demarcations or land use boundaries, further complicating the enforcement of public rights. It is also found that a majority of the population residing near the river are unemployed and the socio-economic conditions compelled them to earn their livelihood by extracting the immediate best natural resources available to them.

This confusion over land ownership and petty socio-economic condition has allowed the affected residents to appropriate their earlier owned river sections for their livelihood; politically connected contractors for their private economic gain, undermining both public accountability and legal recourse.

## 4.2. HIGH TRANSACTION COSTS AND POWER ASYMMETRIES

The second Coasean condition—low transaction costs necessary for bargaining, was also found to be largely unmet. Key barriers to negotiation between upstream and downstream actors include:

Power Asymmetry: Upstream sand miners are backed by local leaders and politicians who protect their activities. Due to the conflict and the increasing machinations of the sand mining, increasingly the moneyed and powerful contractors and local elites have started subsuming the sand mining activities who can not only invest heavily on the mining and also 'deal' with their conflicting counterparts. In contrast, downstream communities—largely composed of farmers and semi-urban settlements are highly unorganised. They either lack direct access to decision-makers and have not successfully organised themselves to counter the sand mining activities, except for the a single organisation called- The Thoubal River Conservation Committee, based in the Thoubal, which is relatively a well-off urban municipal town settlement. This imbalance prevents meaningful negotiation or compensation mechanisms, often leading to street protest and even skirmishes in some occasions (Interview, NGO Representative, March 2023).

Legal and Institutional Gaps: The lack of a State Sand-Mining Policy despite the recommendation of the Sand Mining Framework of India- 2018, a functioning river basin authority or conflict resolution platform leads to aggrieved parties must resort to legal petitions or protests. The 2019 High Court ban on sand mining emerged from such grassroots mobilization leading to petitions, but such petitions overstretched for a long duration in the courts with no subsequent institutional follow-up, limiting its effectiveness.

Social Division and Distrust: Interviews suggest a lack of trust between upstream and downstream communities, with mutual accusations of blame. Sand miners see the ban as a threat to their livelihood, while downstream communities feel betrayed by ongoing illegal extraction despite legal judgments. Sporadic occasions of fights between the groups were narrated to the author which often went unreported to the local police and authorities. There had been instances where the sand carrying trucks were forced to off-load by the protesting downstream communities.

These findings indicate prohibitively high transaction costs that discourage collective bargaining and enable extractive behaviours.

## 4.3. BREAKDOWN OF BARGAINING AND RULE ENFORCEMENT

Despite visible environmental degradation and mounting downstream opposition, there has been no structured attempt at Coasean bargaining between stakeholders. Key factors behind this breakdown include:

Absence of Negotiation Platforms: No formal or informal institutions exist to mediate between sand miners and affected communities. Occasional government raids on illegal mining activities are mostly symbolic and do not result in long-term changes (Interview, Local Official, April 2023).

Selective Law Enforcement: The enforcement of the High Court's ban is widely perceived as ineffective. Sand mining operations continue with impunity in many upstream locations, emboldened by unstrict enforcement, protected by local elites and contractors who have economic stakes in the industry.

Institutional Silence: Despite repeated petitions and protests by organisation such as the Thoubal River Conservation Committee, government agencies like the Manipur Pollution Control Board and the Water Resources Department have remained largely unresponsive.

Thus, the breakdown of bargaining is not due to a lack of awareness or concern, but rather the absence of credible institutions to facilitate or enforce agreements.

## 4.4. NO EFFICIENT OR EQUITABLE OUTCOME

The final Coasean expectation is that voluntary bargaining should lead to Pareto-optimal outcomes—where no party is worse off and at least one is better off. However, the current state of affairs indicates a clear inefficiency:

**Environmental Degradation:** The river's turbidity and ecological health have declined sharply. Rahaman et al., (2024) observed that the water quality of the Thoubal river has been deteriorated and in most locations, the turbidity of the river water was above the WHO guideline permissible limit. Different studies pointed to the increase in Electric Conductivity (EC) of the river water, Dissolved Oxygen (DO) levels, which in turn means the increase in pollution level beyond the WHO recommended safety limits. Local observations and community accounts report extreme reduction in the fish availaibilty, lower water levels, and sediment instability.

**Economic Inequality:** While a small elite of mechanised miners benefits economically, the broader community suffers from water insecurity, erosion, and declining agricultural productivity. The unit economics analysis of the sand mining activity also reveal an unequal share among the labours, machine operators, and owners, where the owners get atleast 60% of the profit, 20-25% by the machine operators and the remaining meagre amount of just 10% by the labours daily. According to some owners, some amount of their earnings goes to the enforcement agencies as bribe.

**Social Conflict:** Infights and tensions between communities have escalated, with growing mistrust and mobilizations around access to natural resources. There were incidents where the downstream communities were resorting to street protests and halting sand carrying trucks (The Hindu, 2018; HY News, 2023 ; KRC TIMES, 2019). On the other hand, the workers were protesting the sand mining ban citing it as an attack on their livelihood (E-Pao, 2018). This heightened rivalry and conflict enhance the absence of a negotiation framework. This leads to the failure in achieving an efficient or equitable outcome reflecting the failure of the Coase Theorem's assumptions in practice. This points toward the need for institutional reform and state-supported negotiation frameworks.

## 5. DISCUSSION AND POLICY IMPLICATIONS

### 5.1. REVISITING THE COASE FRAMEWORK: A MISMATCH IN PRACTICE

The case of the Thoubal River illustrates the limitations of applying the Coase Theorem in real-world common-pool resource (CPR) conflicts. These regions are often seen with with institutional fragility, legal ambiguity, and social and power asymmetry. While the theorem suggests that efficient bargaining can resolve externalities if property rights are defined and transaction costs are low (Coase, 1960), the field evidence reveals multiple anomalies. Property rights over the riverbed are ambiguous and contested. The dual edge of the lack of legal awareness and the lack of enforcement has resulted the confusion over the property rights. Due to heightened social conflict between the upstream and the downstream communities, the lack of trust, absence of negotiation platforms and the significant power asymmetries between these communities result to a prohibitively high transaction cost. Due to multiple factors like inefficient enforcement mechanism, heightened social conflict, increasing cost of sand mining, there have been rampant phenomena of elite capture and illegal privatization of the sand mining. Due to these multiple factors, achieving a Pareto-efficient outcome has become increasing difficult, despite the fact that the ecological and social degradation of the river persists. These gaps align with Ostrom's (1990) argument that the success of CPR management depends not on abstract legal entitlements, but on the presence of locally embedded institutions that can mediate access, monitor use, and resolve conflict.

### 5.2. POLICY IMPLICATION

The Manipur Mineral Policy 2021 recognizes sand and gravel as minor minerals and provides recommendations for licensing sand mining. But, the implementation is rather unsatisfactory and flawed as there is no Registered Qualified Persons (RQPs) exist in Manipur to prepare mining plans, and provisional licenses have been issued illegally, despite no such provision. Following a petition with regards to the above concern and deteriorating conditions of the rivers, the High Court of Manipur imposed a blanket ban on sand mining across all rivers(In Re Preservation Of Thoubal River vs State Of Manipur & Ors, 2020). In response, a comprehensive reform package is needed. First, a Thoubal River Basin Council should be established as a multi-stakeholder institution to manage resource use, mediate disputes, and enforce participatory governance (Agrawal, 2001; Ostrom, 1990). Second, an ecological tax can be introduced to fund a River Restoration Fund and should be levied on sand extraction. Third, the state must undertake demarcation to clarify ownership boundaries and prevent the informal privatisation of riverbeds. Fourth, a livelihood transition plan is essential, including cooperatives for sustainable mining, skill development, and financial support for miners shifting away from illegal activities. Finally, moving beyond the Coasean ideal of voluntary bargaining, governance reforms must

institutionalise equity, accountability, and community participation to restore ecological balance and social justice in the Thoubal River basin.

## 6. CONCLUSION

The Thoubal River conflict highlights a revealing case study into the challenges of governing common-pool resources in institutionally fragile and socio-political complex regions. While the Coase Theorem provides a detailed theoretical model for resolving environmental externalities through private bargaining. This study demonstrates that its foundational assumptions such as well-defined property rights, low transaction costs, and enforceable agreements are rarely fulfilled in practice.

Instead, the evidence from the Thoubal River points to a conflict ridden space shaped by ambiguous ownership claims, livelihood trap, elite capture, selective enforcement, and community disenfranchisement. In this context, the Coasean bargain fails not due to its logic, but because it lacks the institutional infrastructure required to function. This confirms insights from institutional economics and political ecology that effective CPR governance demands more than legal rights; it requires robust, inclusive, and enforceable institutions.

This paper argues for a multi-faceted policy response: the establishment of a river basin institution, implementation of ecological taxation, legal clarification of land use rights, and provision of sustainable livelihood alternatives. These reforms not only address the ecological degradation and social and political tensions in the Thoubal River basin but also offer a blueprint for similar riverine conflicts in other parts of the Global South.

Further research in future can be done on this study by conducting studies across different river systems in Northeast India or the Indo-Burma biodiversity hotspot. Further work is also needed on modelling the economic and ecological outcomes of proposed plan for river taxes or payment for ecosystem services.

Going beyond the theoretical aspect we can move to context-sensitive institutional design. In doing that, we can understand and deal fairly with the complex intersections of sustainable environment, economic necessity, and effective governance.

## CONFLICT OF INTERESTS

None.

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