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LAND GOVERNANCE, BIODIVERSITY CONSERVATION AND COASTAL DEVELOPMENT IN MAHARASHTRA'S KONKAN REGION: AN INTEGRATED POLICY ANALYSIS

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Abstract

The Konkan region of Maharashtra is a socially and ecologically significant coastal landscape where land administration, infrastructure expansion, biodiversity conservation, marine livelihoods and climate risks intersect. Its narrow coastal plains, estuaries, mangroves, lateritic plateaus and links with the Western Ghats sustain agriculture, fisheries, forest-based livelihoods and distinctive local knowledge systems. At the same time, road corridors, ports, industrial projects, tourism and changing land markets are reshaping patterns of land use and access to natural resources. This paper examines the policy and governance challenges arising from these interactions, with particular attention to the Maharashtra Land Revenue Code, 1966; restrictions on agricultural land transfers; land-fragmentation reforms discussed in the source report; the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013; coastal regulation; biodiversity protection; and traditional coastal resource-management systems. The study adopts a qualitative documentary approach, analysing the supplied policy report and its cited statutory and institutional materials as a secondary-source base. It argues that sector-wise administration is insufficient for a landscape in which ecological processes and livelihoods cross administrative boundaries. The central policy challenge is not simply to choose between development and conservation, but to establish accountable institutions capable of assessing cumulative impacts, recognising customary and livelihood rights, and aligning land-use decisions with ecological limits. The paper proposes integrated regional planning, participatory land and resource mapping, cumulative environmental assessment, stronger protection of lateritic plateaus and estuarine systems, sustainable marine tourism, and district-level climate adaptation. The analysis is intended as a policy-oriented research framework; quantitative claims and legal interpretations in the source material require independent verification before being used as definitive evidence.

Keywords: *Konkan; land governance; coastal development; biodiversity conservation; land-use change; customary rights; marine resource management; climate resilience; Maharashtra.*

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1. Introduction

The Konkan is a distinctive coastal region along Maharashtra's western seaboard, extending between the Arabian Sea and the Sahyadri or Western Ghats ranges. The source report identifies Palghar, Thane, Raigad, Ratnagiri and Sindhudurgurg as the principal districts within its regional frame. Its geography includes coastal plains, river estuaries, mangroves, beaches, lateritic uplands and forested slopes. These landscapes are linked through short west-flowing rivers and seasonal monsoon systems. Their ecological functions are inseparable from the economic and cultural lives of farming, fishing and forest-dependent communities.

The region is undergoing significant socio-economic change. Transport infrastructure, ports, industrial development, tourism and urban expansion create opportunities for employment, investment and connectivity. Yet the same processes can alter drainage, fragment habitats, intensify pressure on coastal commons and change the terms on which local communities access land and marine resources. The resulting policy challenge is multidimensional: a land-use decision may affect not only property rights but also water flows, biodiversity, fisheries, disaster exposure and the continuity of traditional livelihoods.

Public policy often addresses these matters through separate administrative domains. Revenue authorities manage land records; forest and wildlife agencies oversee terrestrial conservation; coastal and maritime authorities regulate shorelines and marine activities; fisheries departments address fishing livelihoods; and planning bodies guide infrastructure and settlement growth. Such sectoral arrangements may be necessary for administration, but they can produce gaps where ecological systems and community uses do not follow departmental boundaries. This paper therefore approaches the Konkan as an interconnected social-ecological region and considers how governance can better reconcile development, rights and ecological resilience.

2. Statement of the Research Problem

The central problem examined in this paper is the mismatch between the interconnected character of the Konkan landscape and the fragmented structure of policy planning and implementation. Land conversion, infrastructure projects, coastal regulation, biodiversity protection and livelihood security are frequently considered through distinct procedures. Project-level clearances and parcel-level land records may not adequately reveal cumulative impacts across watersheds, estuaries, wildlife corridors or fishing grounds.

A second dimension concerns the relationship between formal property administration and customary or livelihood-based access. In coastal and reclaimed areas, traditional practices may not be fully represented in cadastral records. Inaccurate or outdated records can complicate inheritance, credit, transactions and dispute resolution. They may also obscure the relationship between recorded ownership and the wider range of community uses that sustain local economies.

The research problem is consequently framed as follows: how can land and coastal governance in Maharashtra's Konkan region be made more integrated, participatory and ecologically informed while ensuring that infrastructure and economic development do not undermine biodiversity and the rights and livelihoods of local communities?

3. Objectives and Research Questions

The paper has five objectives: (i) to examine the principal land-governance instruments and land-record challenges identified for the Konkan; (ii) to analyse the policy implications of infrastructure development and land acquisition; (iii) to assess the relationship between biodiversity conservation, coastal regulation and changing land use; (iv) to consider the position of traditional livelihoods and community-based resource-management systems; and (v) to propose an integrated governance framework that incorporates ecological sensitivity, social equity and climate resilience.

The analysis is guided by the following questions:

1. What land-administration and tenure-related challenges shape development decisions in the Konkan?
2. How can infrastructure and land acquisition processes account for cumulative ecological and livelihood impacts?
3. Which terrestrial, coastal and marine ecosystems require stronger integration in regional planning?
4. How can customary practices and community participation be incorporated into formal decision-making?
5. What institutional and planning reforms could support resilient and equitable coastal development?

4. Research Methodology

This is a qualitative, descriptive and analytical study based on documentary analysis. The primary material is the user-supplied policy report, "Comprehensive Analysis of Konkan Region Policies: Land Governance, Biodiversity Conservation, and Marine Resource Management." The report brings together discussion of statutory frameworks, regional characteristics, policy instruments, illustrative cases and strategic recommendations. Its references include the Maharashtra Land Revenue Code, 1966; the RFCTLARR Act, 2013; Coastal Regulation Zone notifications of 2011 and 2019; the Western Ghats Ecology Expert Panel Report (2011); the High-Level Working Group on Western Ghats Report (2013); and biodiversity assessments attributed to the Bombay Natural History Society.

The material was examined thematically under six broad categories: land tenure and revenue administration; land conversion and fragmentation; infrastructure and acquisition; terrestrial biodiversity; coastal and marine governance; and climate resilience and traditional resource systems. The analysis compares the policy intentions described in the report with the governance risks and implementation gaps it identifies.

The study does not claim to have conducted household surveys, interviews, field observations, GIS analysis or independent ecological measurements. It is therefore a policy-document analysis rather than an empirical impact assessment. Some numerical statements and project-specific claims in the source report are not accompanied by complete datasets or detailed citations. They are treated as reported information requiring verification, not as independently established findings. A full empirical study should triangulate official records, environmental clearances, satellite imagery, district-level statistics and primary evidence from affected communities.

5. Land Governance and Ownership Challenges

The Maharashtra Land Revenue Code, 1966 provides a central statutory framework for land classification, survey, settlement and maintenance of records of rights. The source report identifies the 7/12 extract as a key administrative record used in agricultural credit, property transactions and land-related disputes. Such records are important for establishing recorded interests, but their reliability depends on accurate surveys, timely mutation entries and recognition of relevant rights and claims.

The report highlights several challenges: historical gaps in cadastral surveys; inaccurate or outdated records; delayed recording of inheritance and transfers; fragmentation arising from joint family holdings; and disputes involving reclaimed, intertidal and coastal lands. These issues are especially significant in a dynamic coastal environment, where erosion, accretion, tidal processes and historic bunding practices may complicate the identification of boundaries and use rights.

Digitisation initiatives, including the Digital India Land Records Modernization Programme and online access through Mahabhulekh, can improve accessibility and administrative transparency. However, digitisation alone does not resolve errors in the underlying records. If historical inaccuracies are simply transferred to digital platforms, the appearance of modernisation may coexist with unresolved tenure disputes. Effective reform must therefore combine digital systems with ground verification, participatory mapping, accessible correction procedures and coordination among revenue, forest, coastal and planning authorities.

The report also discusses Section 63 of the Maharashtra Tenancy and Agricultural Lands Act and the process of conversion to non-agricultural use under the land-revenue framework. These provisions illustrate the tension between safeguards intended to protect agricultural land and pressures for urban, industrial and tourism development. The precise application of statutory provisions and exemptions should be checked against the current amended legislation and relevant rules before legal conclusions are drawn.

6. Land Fragmentation, Infrastructure and Acquisition

The source report describes the Maharashtra Prevention of Fragmentation and Consolidation of Holdings (Amendment) Bill, 2025 as introducing deemed regularisation for certain historic fragments and easing the process of recording specified subdivisions. Such measures may address long-standing tenure insecurity and enable households to obtain clearer records. At the same time, regularisation without spatial planning and infrastructure safeguards may encourage dispersed development, increase pressure on agricultural land and expose ecologically sensitive locations to construction.

Infrastructure projects create a related governance challenge. Roads, ports, industrial facilities and tourism infrastructure can improve regional connectivity and economic activity, but their impacts extend beyond the land acquired for the project itself. Changes to drainage, slope stability, sediment movement, access to fishing grounds and habitat connectivity may occur across a wider area. Project-by-project assessment can therefore miss cumulative and indirect effects.

The RFCTLARR Act, 2013 provides a statutory framework for compensation, rehabilitation and resettlement, including Social Impact Assessment provisions. The source report contrasts the Konkan Railway acquisition experience, which it characterises as relatively inclusive and attentive

to assets such as fruit trees, with opposition to the proposed Vadhvan Port. It reports concerns among fishing and tribal communities about access to marine areas and livelihood losses. These examples suggest that acquisition outcomes cannot be evaluated solely by compensation paid for land. Assessment should also consider common-property resources, seasonal livelihoods, social networks, cultural relationships with place and long-term changes in access.

A more robust approach would require independent and transparent Social Impact Assessments, cumulative ecological assessment, public disclosure of alternatives, livelihood restoration plans and monitoring after project approval. Compensation and rehabilitation should be designed around the full range of affected assets and livelihood systems, rather than only formal land title.

7. Biodiversity and the Western Ghats Landscape

The Konkan's ecological significance arises from the close relationship between coastal ecosystems and the Western Ghats. The source report identifies mangroves, estuaries, forests, lateritic plateaus and wildlife corridors as important components of this landscape. Lateritic plateaus, locally known as sadas, are described as distinctive seasonal habitats supporting specialised and endemic flora and fauna. Their ecological value may not be adequately represented by conventional land classifications or market valuations.

The report identifies quarrying, construction and tourism-related pressures as threats to these plateau ecosystems. It also discusses the Tillari Conservation Reserve in Sindhudurgurg as part of a wider wildlife corridor linking Maharashtra, Goa and Karnataka. This cross-border ecological function illustrates why conservation planning cannot be confined to district boundaries.

The Western Ghats Ecologically Sensitive Area debate reflects competing approaches to conservation and development. A policy framework that relies only on broad restrictions may fail to address local livelihood concerns, while a fragmented or overly permissive approach may leave critical habitats exposed. The appropriate response requires transparent ecological criteria, locally accessible information, meaningful participation and differentiated management according to habitat sensitivity and community dependence.

The paper proposes that lateritic plateaus, wetlands, mangroves and wildlife corridors should be explicitly mapped and considered in development plans. Ecological surveys should be undertaken across seasons because the visibility and biological activity of plateau habitats can change substantially through the monsoon cycle. Conservation measures should also recognise the role of local communities as knowledge holders and resource stewards.

8. Coastal and Marine Resource Governance

The Coastal Regulation Zone framework is central to managing development along the Konkan coast. The source report discusses the CRZ Notification, 2019 and raises concerns about changes to no-development provisions and the implications for coastal ecosystems and traditional fishing communities. The implications of particular provisions depend on the applicable coastal zone classification, approved Coastal Zone Management Plan and subsequent legal or administrative directions. Accordingly, specific legal claims should be checked against the official notification and current regulatory instruments.

Marine conservation faces a distinct but connected set of pressures. The report refers to the Malvan Marine Sanctuary and identifies physical damage associated with unregulated tourism as a

concern. It argues for scientifically determined carrying-capacity thresholds for marine tourism. This is an important management principle: visitor numbers, boat movements, anchoring, diving and other activities should be regulated according to ecosystem sensitivity and the capacity of local infrastructure.

Marine resource governance must also recognise the livelihood and knowledge systems of artisanal fishing communities. Conservation measures that restrict access without participation or fair benefit-sharing can create conflict and undermine local legitimacy. Co-management arrangements, transparent fishing rules, seasonal protections, community monitoring and livelihood diversification can strengthen both conservation outcomes and social acceptance.

Integrated coastal zone management should connect terrestrial drainage, estuarine health, mangrove protection, fisheries, tourism and settlement planning. This would help address the fact that pollution, sedimentation and habitat changes originating inland can affect coastal and marine ecosystems.

9. Traditional Socio-Ecological Systems and Community Rights

The source report identifies khar lands and khazan-style engineering as traditional systems for managing salinity and tidal flows in low-lying coastal areas. These systems combine local engineering knowledge, agricultural production and estuarine processes. Their significance is not limited to heritage: they can offer practical lessons for water management, flood adaptation and the maintenance of productive coastal landscapes.

Such systems may be weakened when state-led reclamation, infrastructure construction or modernisation programmes overlook their ecological functions and community institutions. A policy approach that treats these landscapes only as land parcels or engineering sites risks losing accumulated knowledge about seasonal water movement, salinity, bund maintenance and collective management.

Community participation should therefore extend beyond consultation after a project has been designed. Local residents, farmers, fisherfolk and traditional resource users should participate in mapping, assessment, planning, implementation and monitoring. Participatory processes must be inclusive of groups whose rights may be poorly represented in formal records, including tenants, women engaged in agriculture and fisheries, and households dependent on common resources.

10. Climate Resilience and Disaster Risk

The Konkan is exposed to multiple climate and environmental hazards, including intense monsoon rainfall, flooding, landslides, coastal erosion and cyclonic events. The source report emphasises the protective functions of mangroves and estuaries and the need for district-level adaptation planning. It also refers to infrastructure-based measures such as embankment strengthening and anti-erosion works, alongside nature-based approaches such as dune restoration and vegetative buffers.

A resilient strategy should avoid treating disaster management as a separate technical sector. Land-use planning, road construction, drainage design, mangrove protection, slope management and settlement development all influence risk. In some locations, hard engineering may be necessary, but it should be assessed alongside nature-based measures and the possibility of transferring risk to neighbouring areas.

District adaptation plans should be informed by updated hazard maps, local historical knowledge and transparent climate-risk information. They should identify vulnerable settlements and livelihood systems, specify responsibilities across departments and establish monitoring indicators. Community-based early warning, evacuation planning and resilient infrastructure are essential complements to ecosystem restoration.

11. Discussion and Major Findings

The documentary analysis points to five interconnected findings.

First, land-record modernisation is necessary but insufficient. Digital records can improve access and reduce administrative delays, but they cannot by themselves settle customary claims, correct historical survey errors or resolve competing uses of coastal and reclaimed lands.

Second, infrastructure impacts need to be assessed at a regional and cumulative scale. The effects of roads, ports and industrial projects may interact with drainage systems, habitats, fisheries and settlement patterns. A narrow project boundary can therefore understate the full social and ecological consequences.

Third, biodiversity policy must recognise ecosystems that are often undervalued in conventional land-use decisions. Lateritic plateaus, mangroves, estuaries and wildlife corridors provide ecological functions that should be visible in planning instruments and land-use decisions.

Fourth, livelihood security is central to conservation legitimacy. Fishing, farming and customary resource systems are not external to the environment; they are part of the region's social-ecological history. Policies that ignore access rights and local knowledge may generate conflict and weaken implementation.

Fifth, climate resilience requires institutional integration. Coastal hazards, land-use change and ecosystem degradation reinforce one another. Adaptation is therefore most effective when embedded in revenue administration, infrastructure planning, biodiversity management and local governance.

Together, these findings suggest that the Konkan requires a shift from fragmented sectoral administration towards integrated, place-based governance. This does not mean creating a single authority for every function. It means establishing clear coordination mechanisms, shared spatial information, transparent decision rules and meaningful community participation across existing institutions.

12. Policy Recommendations

1. Establish an integrated Konkan regional planning framework that connects district plans, coastal zone management, infrastructure proposals, biodiversity priorities and climate-risk information.

2. Create a geospatial land and resource information system that links cadastral records with ecological sensitivity, customary-use areas, hazard zones, mangroves, wetlands, lateritic plateaus and wildlife corridors. Data should be accessible, regularly updated and subject to community verification.

3. Strengthen land-record correction and dispute-resolution mechanisms. Digitisation should be accompanied by ground surveys, timely mutation, public notice, accessible appeals and procedures to document legitimate livelihood and community uses.

4. Require cumulative social and ecological assessment for major infrastructure and industrial proposals. Assessments should cover watersheds, estuaries, fisheries, habitat connectivity, induced development and cumulative pressures from multiple projects.
5. Protect lateritic plateaus and other sensitive habitats through scientifically informed mapping, seasonal ecological surveys and appropriate land-use controls. Decisions should be transparent and developed with local stakeholders.
6. Strengthen community-based coastal and marine co-management. Fishing communities should participate in the design of conservation rules, tourism standards, seasonal restrictions and benefit-sharing mechanisms.
7. Introduce carrying-capacity and monitoring systems for sensitive marine tourism locations, including the Malvan area. Monitoring should consider reef condition, visitor pressure, boat activity, waste management and community impacts.
8. Recognise and strengthen traditional systems such as khar lands through technical support, community institutions and integration into climate-adaptation programmes.
9. Prepare district-level climate adaptation plans that combine nature-based solutions, resilient infrastructure, hazard mapping, early warning and community preparedness.
10. Establish a regional observatory or knowledge platform involving universities, research institutions, local bodies and community organisations. It should publish periodic reports on land-use change, ecological conditions, livelihood impacts and policy implementation.

13. Limitations and Scope for Further Research

This paper is based on a single supplied policy report and the references listed within it. It does not independently verify every statistic, legal interpretation, project status or ecological claim contained in that report. The source provides a broad policy synthesis, but it does not supply a complete research dataset, detailed sampling design, interview transcripts or reproducible GIS analysis. Consequently, the findings should be read as analytical conclusions from documentary material rather than as measured causal effects.

Further research should include district- and taluka-level land-use mapping; comparison of historical cadastral records with satellite imagery; field surveys of farmers, tenants, fisherfolk and forest-dependent households; assessment of the distribution of project costs and benefits; and ecological monitoring of lateritic plateaus, mangroves, estuaries and marine habitats. Comparative case studies across Palghar, Thane, Raigad, Ratnagiri and Sindhudurg could clarify how institutional capacity and local conditions shape policy outcomes. Legal analysis should use the latest official versions of statutes, amendments, rules, notifications and court directions.

14. Conclusion

The Konkan region demonstrates the complexity of governing a coastal landscape where ecological systems, land markets, infrastructure ambitions and traditional livelihoods are closely connected. The policy instruments discussed in the source report address important dimensions of this landscape, but their effectiveness depends on coordination, implementation capacity, reliable information and public accountability. Land-record digitisation, acquisition safeguards, coastal regulation and biodiversity programmes cannot achieve their full purpose when planned and implemented in isolation.

The central argument of this paper is that sustainable development in the Konkan requires an integrated governance approach that places ecological limits and livelihood security within mainstream planning. This means recognising the full value of coastal commons and sensitive habitats, strengthening land administration without erasing customary uses, assessing cumulative impacts before approving major projects, and involving communities as partners in conservation and adaptation.

The future of the Konkan should not be framed as a choice between economic development and environmental protection. Its long-term prosperity depends on development pathways that maintain the ecological foundations of agriculture, fisheries, tourism and settlement. A regionally coordinated, evidence-based and participatory policy framework offers a practical route towards that objective.

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