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Invisible Engines of Growth: Odisha as a Laboratory for Algorithmic Welfare, Silent Urbanization, and the Cultural Web3 Economy in Viksit Bharat @2047

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ABSTRACT

India's aspiration to emerge as a developed nation by 2047 under the vision of *Viksit Bharat* necessitates the identification and scaling of localized innovations. Odisha, characterized by its socio-cultural diversity and rapid technological transition, presents a compelling case as a living laboratory for future-ready developmental models. This study positions Odisha at the intersection of three transformative domains: algorithmic welfare systems, governance challenges arising from silent urbanization, and the digitization of cultural heritage through Web3 technologies such as NFTs.

By integrating quantitative modeling, qualitative fieldwork, and policy analysis, the study proposes a framework for culturally rooted, inclusive, and decentralized development. The findings suggest that Odisha's experiments in adaptive welfare delivery, the recognition of hybrid urban spaces, and digital cultural economies not only address local challenges but also offer scalable insights for national policy. The state thus emerges as a microcosm of a technologically empowered, socially equitable, and culturally vibrant Viksit Bharat.

Keywords: Algorithmic Welfare, Silent Urbanization, Cultural NFTs, Odisha, Inclusivity, Decentralization

INTRODUCTION

India's ambition to transition into a developed nation by 2047 is anchored in inclusive growth, technological innovation, and cultural preservation. Within this broader vision, states such as Odisha—often underrepresented in conventional economic discourse—offer valuable insights into grassroots innovation and adaptive governance.

This study explores three underexamined yet critical domains shaping the future of development.

First, the evolution from static subsidy frameworks to dynamic, data-driven welfare systems is evident in Odisha's initiatives such as KALIA and BSKY. These programs demonstrate how real-time data integration can enhance targeting efficiency and reduce exclusion errors.

Second, the phenomenon of silent urbanization—where settlements exhibit urban characteristics without formal recognition—poses significant governance challenges. Odisha's expanding census towns exemplify this structural gap between demographic reality and administrative classification.

Third, Odisha's rich cultural heritage, including traditional art forms such as Pattachitra and Gotipua dance, holds immense potential within the global creative economy. The emergence of Web3 technologies, particularly NFTs, provides new avenues for digitizing and monetizing these cultural assets, thereby empowering local artisans.

The convergence of these domains positions Odisha as a unique experimental space for reimagining development that is technologically advanced, spatially inclusive, and culturally grounded.

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LITERATURE REVIEW

Contemporary development discourse increasingly emphasizes decentralized innovation, context-specific interventions, and digital public infrastructure. Odisha's governance framework, particularly its 5T model (Teamwork, Technology, Transparency, Time, and Transformation), has attracted significant scholarly and policy attention.

The concept of algorithmic welfare has gained global prominence, highlighting both its transformative potential and ethical concerns. Studies by Eubanks (2018) and Drèze and Sen (2013) underscore the risks of exclusion and data bias, while international examples from countries such as Brazil and Estonia illustrate the shift toward real-time, AI-enabled public service delivery. Odisha's KALIA and BSKY schemes reflect early adoption of such models in the Indian context.

Silent urbanization has been extensively examined by Denis and Zérah (2017), who identify governance deficits in India's census towns. Odisha, with more than 90 such settlements, exemplifies the challenges of infrastructural inadequacy and administrative ambiguity.

In the realm of the creative economy, Web3 technologies and NFTs are emerging as tools for intellectual property protection and digital monetization. However, existing literature predominantly focuses on developed economies, with limited attention to rural and culturally rich regions such as Odisha. The integration of digital frameworks such as DEPA and India's Draft National Intellectual Property Policy offers new possibilities for cultural data ownership and economic participation.

This study builds upon interdisciplinary approaches that advocate policy convergence across welfare systems, urban governance, and creative industries.

RESEARCH METHODOLOGY

This research adopts a mixed-methods approach, combining quantitative analysis, qualitative inquiry, and policy evaluation.

Quantitative Analysis

- **GIS Mapping:** Spatial analysis of census towns using indicators such as night-time luminosity, population density, and informal employment patterns.
- **Algorithmic Simulations:** Modeling welfare distribution using datasets from KALIA and SHG networks to assess the impact of dynamic eligibility criteria.
- **Revenue Forecasting:** Simulation of NFT-based income models using global platform benchmarks, adjusted for local purchasing power and accessibility.

Qualitative Research

- **Semi-Structured Interviews:** Conducted with beneficiaries, SHG leaders, artisans, and local administrators in regions such as Kandhamal, Raghurajpur, and Balasore.
- **Ethnographic Observations:** Field studies in urban fringe areas and cultural hubs to capture socio-economic transitions and challenges related to digital adaptation.

Policy and Legal Analysis

- Evaluation of flagship schemes (BSKY, KALIA, and Mo Sarkar), focusing on data governance, accountability, and interoperability.

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- Review of urban policy frameworks and cultural intellectual property regulations in alignment with national initiatives such as DEPA.

RESULTS AND ANALYSIS

The findings reveal Odisha's significant potential across three interconnected domains.

- **Algorithmic Welfare:** The transition from static beneficiary lists to dynamic, data-driven targeting enhances efficiency and inclusivity.
- **Urban Governance Gaps:** GIS analysis highlights the administrative invisibility of census towns, resulting in service deficits despite their urban characteristics.
- **Cultural Digitization:** Pilot NFT initiatives demonstrate both economic potential and challenges related to digital literacy and regulatory frameworks.

Case Studies

- **Raghurajpur:** Experimental NFT initiatives indicate promising avenues for monetizing traditional art through digital platforms and smart contracts.
- **Kandhamal:** The integration of SHG data into welfare delivery improves gender-sensitive subsidy targeting and enhances trust in public systems.
- **Balasore:** A representative census town facing infrastructural and governance challenges due to its ambiguous administrative status.

Suggestions and Conclusion

Odisha's developmental trajectory offers valuable lessons for achieving the vision of Viksit Bharat @2047.

Key Recommendations

1. **Adopt Real-Time Welfare Systems:** Scale AI-enabled, SHG-integrated subsidy models nationwide while ensuring compliance with data protection frameworks.
2. **Formalize Census Town Governance:** Establish intermediate administrative structures with financial and functional autonomy.
3. **Develop Cultural NFT Ecosystems:** Create state-supported platforms with embedded intellectual property protection to enable global market access for artisans.
4. **Promote Policy Convergence:** Integrate welfare, urban planning, and cultural policies to address complex socio-economic realities holistically.

In conclusion, Odisha represents not merely a regional case but a scalable model for inclusive, technology-driven, and culturally enriched development.

Social and Managerial Implications

- Policymakers can leverage real-time data systems to enhance welfare efficiency.
- Urban planners must redefine frameworks to accommodate hybrid settlements.
- Cultural administrators can harness Web3 technologies to empower creators.

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- Managers can align technological innovation with grassroots realities to achieve sustainable outcomes.

Future Scope of Research

Future studies may explore:

- Economic modeling of NFT-based cultural ecosystems
- Application of federated learning for data privacy in welfare systems
- Political and social implications of formalizing census towns
- Replicability of Odisha's model across regions with similar socio-economic conditions

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