



## Group 6

# Blockchain and AI-Enabled Income Traceability System for Equitable Welfare Distribution

## Abstract

Ensuring equitable welfare distribution and accurate income assessment for daily wage and informal sector workers in India remains a persistent challenge. Existing methods such as income tax filings, government surveys like the Periodic Labour Force Survey (PLFS) and the Socio-Economic Caste Census (SECC), ration card declarations, and banking data are either infrequent, fragmented, or exclude the vast informal workforce, which constitutes over 80% of India's labor population. This results in unreliable, easily manipulated, or self-declared income records. Consequently, many individuals falsely claim Below Poverty Line (BPL) status, inflating the BPL population and causing misallocation of welfare resources. This deprives genuinely deserving populations of adequate benefits, contributing to social and economic inequities. To address these challenges, we propose an Income Traceability System powered by blockchain and AI/ML technologies. The system immutably records every digital wage payment on a private blockchain, creating a tamper-proof, verifiable income history. AI models accurately estimate income bands, dynamically classify individuals for welfare eligibility such as BPL or Above Poverty Line (APL). Additionally, the system offers a government-ready, real-time monitoring dashboard for policymakers, ensuring privacy-preserving data handling, context-aware income profiling, and automated welfare eligibility flagging. Compared to traditional methods, this system offers greater accuracy, real-time insights, and adaptability to the fluctuating nature of informal sector incomes. By integrating blockchain-verified wage records with AI-driven analytics, the framework enhances the fairness, integrity, and efficiency of welfare delivery, ensuring benefits reach the truly deserving. Combined with strong governmental reforms promoting digital and cashless transactions, the system can also help curb illegal activities like money laundering, tax evasion and unaccounted financial flows, contributing to a more transparent, inclusive, and economically resilient society.



**EXPECTED INPUT: (All inputs are simulated due to security reasons)**

- **PAN / Aadhaar Number** — Unique identifier for each worker (optionally anonymized for privacy)
- **Wage Payment Data** — Amount paid, date/time, transaction ID, and payment mode (UPI, bank transfer)
- **Job Type / Sector** — Nature of employment (e.g., construction, housekeeping) to contextualize income
- **Government Threshold Data** — Income ceilings for BPL/APL classification as defined by policy
- **Policy Parameters** — Specific eligibility rules for welfare schemes (e.g., income cutoffs, sector priorities)
- **Banking/UPI APIs** — Interfaces to fetch and verify digital payment records

**EXPECTED OUTPUT:**

- **Immutable Wage Record** — Tamper-proof transaction history recorded on blockchain
- **Estimated Annual Income** — AI-predicted total yearly income for each worker
- **Dynamic BPL/APL Classification** — Real-time classification based on updated income data
- **Welfare Eligibility Flags** — Automated indicators of eligibility for welfare schemes
- **Policy Monitoring Dashboard** — Visual tool for authorities to monitor income trends and eligibility distributions

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