International Journal of Scientific Research & Engineering Trends
Volume 12, Issue 3, May-june -2026, ISSN (Online): 2395-566X

Eco-Rupees: Plastic to Pride

Eeshritha

Abstract- India generates millions of tonnes of plastic waste annually, much of which is non-biodegradable. This paper explores the feasibility of using recycled polypropylene (PP) to produce polymer currency notes. Drawing on Australia's pioneering adoption of polymer banknotes, the study eval-uates technical, economic, policy, and social challenges, and proposes a phased roadmap for India to transition towards sustainable currency pro-duction. The findings suggest that recycled PP notes could simultaneously address waste management, enhance currency durability, and position India as a global leader in sustainable finance innovation.

Index Terms- Recycled polypropylene, polymer banknotes, plastic waste management, sustainable currency, circular economy, India, recycling innovation, eco-friendly finance.

I. INTRODUCTION

Plastic waste is a pressing environmental challenge in India. While recycling initiatives exist, they remain insufficient to address daily accumulation. This paper proposes an innovative solution: printing currency notes using recycled polypropylene. Such notes would be tear-resistant, durable, and environmentally beneficial.

II. LITERATURE REVIEW

Polymer banknotes have been studied extensively in economics and materials sci-ence.

- Australia: First adopter in 1988, achieving significant savings and reduced counterfeiting.
- Canada: Transitioned in 2011, reporting $400M savings over a decade.
- UK: Adopted in 2016, citing durability and security.
- Nigeria and Romania: Demonstrated polymer notes' adaptability in di-verse economies.
-

Studies from the IMF and CSIRO highlight the cost-benefit balance of polymer notes, while RBI reports emphasize India's need for durable currency solutions.

III. GLOBAL CASE STUDY: AUSTRALIA'S POLYMER BANKNOTES

Australia was the first country to fully adopt polymer banknotes, beginning in 1988. By 1996, all denominations had transitioned. Motivations included coun-terfeiting threats, durability, and environmental benefits. Despite higher initial costs, Australia achieved net savings of nearly $1 billion AUD over 25 years, while reducing counterfeit circulation. The success influenced over 60 countries, including Canada, the UK, and Nigeria.

IV. POLYPROPYLENE AS A CURRENCY SUBSTRATE

Polymer notes worldwide are made from biaxially oriented polypropylene (BOPP). PP offers durability, resistance to moisture and dirt, recyclability, and the ability to embed advanced security features. India's innovation lies in adapting recycled PP packaging waste into high-grade BOPP films for currency.

V. COMPARATIVE DATA

Paper Vs Polymer Lifespan

Material	Average Lifespan	Replacement Cost	Counterfeit	
Resistance Paper		6-12 months	High	Low
Polymer	2-3 years	Lower	High	

Country Adoption

Country	Year Adopted	Savings (USD)	Counterfeiting Reduction
Australia	1988–1996	$1B over 25 yrs	Major decline
Cana	2011	$400M	Significant

da		over 10 yrs	
UK	2016	$200M est.	Strong
Nigeria	2007	Not disclosed	Moderate

VI. CHALLENGES

Technical
Ensuring purity of recycled PP, establishing specialized recycling plants, and main-taining consistency in film quality are critical hurdles.

Economic
High initial costs, supply chain setup, and balancing long-term savings against upfront investment pose challenges.

Policy
Approval from the Reserve Bank of India and Ministry of Finance, counterfeit concerns, and pilot testing requirements must be addressed.

Social
Public acceptance, awareness campaigns, and cultural sensitivity around currency design are essential for success.

VII. PROPOSED ROADMAP

A phased approach is recommended:

- Introduce recycled PP notes in lower denominations (10, 20).
- Partner with IITs and CSIR labs to develop high-grade BOPP films.
- Conduct pilot testing for durability and security.
- Launch awareness campaigns branding notes as “Eco-Rupees.”
- Establish recycling plants and supply chain networks.
- Train RBI printing presses for polymer substrates.
- Incentivize public participation in PP waste collection.

VIII. DISCUSSION

The transition could be achieved within 6–10 years. Benefits include economic gains from longer-lasting notes, environmental impact through waste diversion, social pride in sustainable innovation, and global recognition of India’s leadership.

IX. CONCLUSION

India stands at a crossroads where innovation and sustainability can converge through its currency. By transforming recycled polypropylene waste into durable polymer notes, India could modernize its financial system and pioneer a global first: a currency that embodies both economic resilience and ecological responsi-bility.

REFERENCES

1. Reserve Bank of Australia, “History of Polymer Banknotes,” RBA Publica-tions.
2. CSIRO, “Polymer Substrate Development,” Technical Reports.
3. International Monetary Fund, “Currency Durability and Cost Analysis,” IMF Working Papers.
4. Bank of Canada, “Polymer Banknote Adoption,” Official Reports.
5. Reserve Bank of India, “Currency Management Reports,” RBI Publications.