Page: 1395-1414 *URL: www.lijdlr.com*

LAWFOYER INTERNATIONAL JOURNAL OF DOCTRINAL LEGAL RESEARCH

ISSN: 2583-7753

LawFoyer International Journal of Doctrinal Legal Research

[ISSN: 2583-7753]

Volume 4 | Issue 1

2026

DOI: https://doi.org/10.70183/lijdlr.2026.v04.59

THE E-RUPEE: A ROADMAP FOR INDIA'S DIGITAL CURRENCY

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I. ABSTRACT

The introduction of the e-Rupee, India's proposed Central Bank Digital Currency (CBDC) issued by the Reserve Bank of India (RBI), represents a significant milestone in the evolution of sovereign digital money. As economies across the world increasingly move toward digital financial systems, CBDCs have emerged as a state-backed alternative to private cryptocurrencies and existing electronic payment mechanisms. This paper examines the legal, constitutional, and regulatory implications surrounding the implementation of the e-Rupee within India's existing financial and legal framework. The study adopts a doctrinal and comparative research methodology. It analyses statutory provisions governing currency issuance, payment systems, and data protection in India while also evaluating international CBDC experiences, particularly those of the Bahamas (Sand Dollar), Nigeria (eNaira), and China (e-CNY). Through this analysis, the paper identifies key legal challenges associated with the e-Rupee, including the absence of explicit statutory recognition under the Reserve Bank of India Act, 1934, questions relating to legal tender status, privacy concerns arising from transaction traceability, and potential regulatory gaps in payment system governance. The research further evaluates India's digital infrastructure readiness, considering the role of the Unified Payments Interface (UPI), the Jan Dhan–Aadhaar–Mobile (JAM) ecosystem, and the challenges of cybersecurity and digital inclusion. Lessons drawn from global CBDC implementations highlight the importance of strong privacy safeguards, offline payment functionality, public adoption strategies, and regulatory clarity. The paper ultimately argues that the successful implementation of the e-Rupee requires targeted legislative reforms, robust data protection safeguards, and a carefully designed regulatory framework that balances technological innovation with constitutional protections. By addressing these legal and infrastructural considerations, India can develop a CBDC system that promotes financial

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 (ISSN: 2583-7753)

inclusion, strengthens monetary sovereignty, and maintains public trust in the evolving digital economy.

II. KEYWORDS

Blockchain, CBDC, Digital Currency, E-Rupee & RBI.

III. INTRODUCTION

A. The Global Shift to Digital Currencies

The evolution of money has, in many ways, mirrored the evolution of human society.[2] Every advancement has brought about a radical transformation in the way societies trade value, from the exchange of goods to metal coins, from paper currency to plastic cards, and now to e-wallets.[3] Money has not only facilitated trade but also produced economies, politics, and power at every turn.[4] The twenty-first century finds us at the threshold of something new again, the emergence of Central Bank Digital Currencies (CBDCs).

The true motivator for this new transformation can be traced back to the disruptive onset of Bitcoin in 2009.[5] Created as a decentralised substitute for fiat currency, Bitcoin and later the entire realm of cryptocurrencies held the promise of peer-to-peer exchange of value without the need for an intermediary, such as banks or state control. Although they sparked global debates on the future of finance, cryptocurrencies also revealed their downsides, including price volatility, a lack of legal recognition, and susceptibility to speculation and abuse.[6] Nevertheless, what they provided was potent: the very Blockchain and its Distributed Ledger Technology (DLT) upon which secure, traceable, and quick transactions became possible.[7] This technology innovation came to the notice of central banks, which recognised the potential of

[2] Mahya Karbalaii, Monetary Evolution: How Societies Shaped Money from Antiquity to Cryptocurrencies, 6 Int'l J. Blockchains & Cryptocurrencies 132 (2025).
[3] Niall Ferguson, The Ascent of Money: A Financial History of the World 21–28 (2008).
[4] Geoffrey Ingham, The Nature of Money 95–103 (2004).
[5] Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System 1 (2008), https://bitcoin.org/bitcoin.pdf.
[6] Nouriel Roubini, The Big Blockchain Lie, PROJECT SYNDICATE (Oct. 15, 2018), https://www.project-syndicate.org/commentary/blockchain-big-lie-by-nouriel-roubini-2018-10.
[7] Arvind Narayanan et al., Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction 35–47 (2016).

combining state authority and digital expertise. Unlike cryptocurrencies, CBDCs are not assets bought and sold speculatively but digital representations of sovereign money, created and backed by central banks.[8]

The significance of CBDCs is their promise to transform the world's finance for the better. They ensure fast transactions while reducing their cost, particularly across borders; induct millions into the formal economy; and provide monetary sovereignty in a world where private payment systems and cryptocurrencies are gaining prominence.[9] Through government support, CBDCs help developing countries like India become more inclusive, transparent, and less dependent on cash while building trust in digital payments.[10]

With the launch of the e-Rupee pilot, the RBI took a minor yet important step towards that future.[11] The CBDC comes to a world that is already full of digital innovation, thanks to the Unified Payments Interface (UPI), which has transformed the entirety of wholesale and retail transactions by making them instantaneous, smooth, and compatible.[12] The e-Rupee is a digital currency, while the UPI acts as a layer over the conventional bank accounts and infrastructure. Because of this, the distinction is significant: UPI is a payment method, while CBDC is money in and of itself, subject to financial regulation, monetary policy, and even implications for the concept of legal tender.[13]

From China's digital yuan, Bahamas' Sand Dollar and Nigeria's eNaira, countries are coming up with their own plans, each with its own objectives.[14] The question of

[8] Bank for International Settlements (BIS), Central Bank Digital Currencies: Foundational Principles and Core Features 3–5 (2020).
[9] Int'l Monetary Fund, Central Bank Digital Currency: A New Tool in the Financial Inclusion Toolkit? IMF Staff Discussion Note (2022).
[10] Reserve Bank of India, Concept Note on Central Bank Digital Currency 4–7 (Oct. 2022).
[11] Press Release, Reserve Bank of India, RBI Announces Launch of First Pilot for Retail Digital Rupee (Nov. 29, 2022), https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=54676.
[12] National Payments Corporation of India (NPCI), UPI Product Statistics (2024), https://www.npci.org.in/what-we-do/upi/product-statistics.
[13] Rabi Sankar, Deputy Governor, RBI, Central Bank Digital Currency-Is This the Future of Money? (July 22, 2021), https://rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1111.
[14] Mu Changchun, Progress of Research & Development of E-CNY in China, People's Bank of China White Paper (July 2021); Central Bank of The Bahamas, Project Sand Dollar (2019); Int'l Monetary Fund, Nigeria's eNaira, One Year After (2022).

whether or not money will go digital has been replaced by the questions of how and by whom. When properly planned and implemented, CBDCs have the potential to be the most powerful financial invention of our time, changing economies and redistributing the power between the government, markets, and citizens. [15]

B. A Brief History of CBDC

When central banks seriously looked at digital sovereign money around the mid-2010s, the idea of a decentralised cryptocurrency was not at the forefront of their thoughts. It was not merely the speculative nature of Bitcoin that attracted attention when Bitcoin emerged in 2009, but rather the underlying technological innovation of blockchain and distributed ledger technology. Basically, a distributed ledger that enables secure, transparent, and lightning-fast transactions.[16]

The People's Bank of China was the first big player to dedicate itself to a digital yuan, kickstarting the formal inclusion of Central Bank Digital Currencies in policy debates.[17] In 2016, the Bank of England published a landmark working paper by Barrdear and Kumhof examining the macroeconomic implications of a Central Bank Digital Currency (CBDC), which significantly advanced academic discourse on the subject.[18] Simultaneously, the Bank of Canada and Sweden's Riksbank began their research on this topic, with the Swedish Riksbank in particular examining its "e-krona" because the number of people using cash is declining in their country.[19]

Central bank digital currencies had gained tremendous momentum by the year 2017. The Bank for International Settlements began bringing together international research and exploring the implications of a legal digital tender.[20] The Sweden e-krona experiment was one of the things everyone was watching and then came the

[15] BIS, CBDCs: An Opportunity for the Monetary System, Annual Economic Report 65–80 (2021).
[16] Supra note 6.
[17] Supra note 13.
[18] John Barrdear & Michael Kumhof, The Macroeconomics of Central Bank Issued Digital Currencies, Bank of England Working Paper No. 605 (July 2016), https://www.bankofengland.co.uk/working-paper/2016/the-macroeconomics-of-central-bank-issued-digital-currencies.
[19] Sveriges Riksbank, The Riksbank's e-krona Project (2020), https://www.riksbank.se/en-gb/payments--cash/e-krona/.
[20] Bank for Int'l Settlements, Central Bank Digital Currencies (Comm. on Payments & Market Infrastructures Report, Mar. 2018).

bombshell announcement of Facebook's Libra in 2019, sending shockwaves through the monetary world. Central banks have worried that private companies could encroach on the territory of sovereign money, and since then, the urgency for a CBDC has been a top priority.[21]

The COVID-19 pandemic added further impetus to CBDC projects, with their promise of safe, contactless, and reliable payment.[22] The first CBDC to become operational was the Sand Dollar of the Bahamas in 2020.[23] The same year, the Chinese government accelerated its plans to trial the digital yuan and even showcased its use at a considerable scale during the 2022 Winter Olympics.[24] Nigeria became the first African nation to launch a CBDC with the 2021 introduction of the eNaira.[25] Central banks in Europe and North America have since become active in pilot projects and exploratory papers. Today, over 130 countries account for the majority of the global GDP and are at various stages of CBDC research or testing.[26] While the priorities of developed economies have centred on stability, efficiency, and cross-border payments, those of developing economies have focused more on financial inclusion and alternatives to physical cash. CBDCs have gone from an academic exercise to a real-world experiment and are at the heart of the debate over the future of money.[27]

C. Regulatory Situation in India

Like other countries experimenting with digital currencies, India is also developing its CBDC.[28] India already has the Unified Payments Interface (UPI), one of the world's most sophisticated digital payment systems, giving it an advantage.[29] UPI lets users conduct real-time transactions and bank account operations quickly and efficiently. However, the UPI is a payment mechanism that utilises existing bank funds.[30] In

[21] Id.
[22] Supra note 8.
[23] Central Bank of The Bahamas, Project Sand Dollar: A Bahamas Payments System Modernisation Initiative (Sept. 2020).
[24] Supra note 13.
[25] Int'l Monetary Fund, Nigeria's eNaira, One Year After, IMF Country Focus (2022).
[26] Atlantic Council, CBDC Tracker (2024), https://www.atlanticcouncil.org/cbdctracker/.
[27] Bank for Int'l Settlements, CBDCs: An Opportunity for the Monetary System, BIS Ann. Econ. Rep. ch. III (2021).
[28] Reserve Bank of India, Concept Note on Central Bank Digital Currency 3–5 (Oct. 2022).
[29] Supra note 11.
[30] Id.

contrast, the RBI is working on the e-Rupee, an Indian CBDC, which represents money in a digital form that parallels the existing monetary system and is directly issued and backed by the RBI.[31] This is not a replacement for the UPI system but will work in complement to it.

Thanks to the rise of cryptocurrencies, China's development of the digital yuan, and international debates about monetary sovereignty, the RBI became interested in CBDCs. The 2017 inter-ministerial panel, which was set up to look into virtual currencies, was the first to raise the issue of a CBDC.[32] The panel suggested banning private virtual currencies but recommended further examination of the issue of a state-issued virtual currency.[33] The 2018-2019 annual reports of the RBI expressed unwavering scepticism towards private virtual currencies while simultaneously pursuing fiat digital currency.[34] The concept of an "e-Rupee" was slowly emerging in the policy discourse.

In 2021, RBI Deputy Governor T. Rabi Sankar was the first to publicly explain the central bank's position.[35] He said that the RBI was working on a CBDC, which he described as the 'most advisable' evolution of currency, and that the RBI was working on a phased implementation.[36] The Union Budget of 2022-23 became the first to make the official announcement.[37] Finance Minister Nirmala Sitharaman stated that the RBI will issue the Digital Rupee based on Blockchain Technology.[38] Subsequently, on November 1, the RBI initiated the e₹-W pilot for the government securities market.[39] On 1st December, the e₹-R pilot was launched in shortlisted cities, where citizens could transact using digital tokens in the wallets provided by participating banks.[40]

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[31] Supra note 27.
[32] Ministry of Finance, Govt. of India, Report of the Inter-Ministerial Committee on Virtual Currencies ¶¶ 5.1–5.4 (Feb. 2019).
[33] Id.
[34] Reserve Bank of India, Annual Report 2018–19 89–90 (2019).
[35] Supra note 12.
[36] Id.
[37] Budget Speech, 2022–23, ¶ 93 (Nirmala Sitharaman, Minister of Finance, Govt. of India, Feb. 1, 2022).
[38] Id.
[39] Press Release, Reserve Bank of India, RBI Announces Launch of First Pilot for Wholesale Digital Rupee (Nov. 1, 2022).
[40] Id.

This pilot initiative in 2022 marked India's official entry into the CBDC market.[41] In November 2022, the procedure began with interbank settlements using a wholesale CBDC, while in December, cities including Mumbai, New Delhi, Bengaluru, and Bhubaneswar were selected for a retail test for a small group of users.[42] The RBI emphasised its plan to implement these technologies more cautiously and characterised this as a limited trial.[43]

The driving forces behind implementing an e-Rupee system are that it reduces hard cash usage, eliminates printing and distribution costs, and provides a safe alternative to its already vibrant digital economy.[44] Additionally, the e-Rupee might increase the system's efficiency in lowering the expenses associated with digitising international boundaries.[45] It strengthens the nation's influence over private cryptocurrencies by giving its citizens a digital alternative.[46] The e-Rupee has the same irrevocable guarantee as physical currency cash held in a commercial bank since it is a direct obligation of the Reserve Bank of India.[47]

India's acceptance of digital currency has been cautious but aspirational.[48] When assessing India's course and the global impact that its decisions will have, it will be essential to consider the effects of other CBDCs, such as China's centralised e-CNY and the Bahamas' Sand Dollar, as the e-Rupee develops.[49]

D. Research Objectives

1. To examine the legal issues and challenges of implementing the e-Rupee in India.
2. To analyse if the current financial and digital infrastructure is ready to support a digital currency like the e-Rupee.

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[41] Id.
[42] Id.
[43] Supra note 27.
[44] Id.
[45] Id.
[46] Id.
[47] Id.
[48] Id.
[49] Supra note 13.

3. To evaluate similar international CBDC models and identify the lessons India can learn.
4. To suggest ways to build a clear and safe legal framework that ensures the proper rollout of the e-Rupee.

E. Research Questions

The present study is guided by the following research questions:

1. Whether the existing legislative framework in India, particularly the Reserve Bank of India Act, 1934 and the Payment and Settlement Systems Act, 2007, is adequate to recognise and regulate the e-Rupee as a legally enforceable form of sovereign digital currency.
2. What constitutional and legal concerns especially those relating to privacy, data protection, and legal tender status may arise from the implementation of a Central Bank Digital Currency in India.
3. What lessons can India derive from international CBDC experiments such as the Bahamas' Sand Dollar, Nigeria's eNaira, and China's e-CNY in designing a secure and inclusive regulatory framework for the e-Rupee.

F. Research Methodology

This research adopts a doctrinal and comparative legal methodology. The doctrinal component of the study involves an examination of statutory provisions governing currency issuance, payment systems, and data protection in India, including the Reserve Bank of India Act, 1934, the Payment and Settlement Systems Act, 2007, and relevant constitutional provisions relating to monetary authority and privacy rights.

In addition, the paper undertakes a comparative analysis of selected international Central Bank Digital Currency (CBDC) models, particularly the Sand Dollar (Bahamas), eNaira (Nigeria), and the Digital Yuan (China). These case studies are analysed to identify regulatory approaches, technological design choices, and adoption challenges that may offer useful lessons for India's proposed e-Rupee framework.

 (ISSN: 2583-7753)

The research relies primarily on secondary sources, including policy reports published by the Reserve Bank of India (RBI), the Bank for International Settlements (BIS), and the International Monetary Fund (IMF), as well as academic scholarship and legal commentaries on digital currencies and financial regulation.

G. Literature Review

The rapid emergence of Central Bank Digital Currencies (CBDCs) has generated substantial academic and policy debate regarding their legal, economic, and technological implications. Reports published by the Bank for International Settlements (BIS) and the International Monetary Fund (IMF) highlight the potential of CBDCs to improve payment efficiency, strengthen monetary sovereignty, and expand financial inclusion. At the same time, these studies caution that the design of CBDCs must carefully balance innovation with concerns relating to financial stability and privacy protection.

Within the Indian context, the Reserve Bank of India's Concept Note on Central Bank Digital Currency (2022) provides the foundational policy framework for the e-Rupee. The report emphasises that a CBDC could complement existing digital payment systems while reducing reliance on physical cash and lowering transaction costs. However, scholars have also raised concerns regarding the legal status of digital currency under existing financial statutes and the possible implications for data governance and surveillance.

Academic literature further examines international CBDC experiments. Studies on the Bahamas' Sand Dollar highlight its role in promoting financial inclusion in geographically dispersed economies, while analyses of Nigeria's eNaira demonstrate the challenges of public adoption despite technological readiness. Research on China's Digital Yuan (e-CNY) has focused on its potential geopolitical implications and the model of "controllable anonymity" adopted in its design.

This body of literature indicates that the successful implementation of CBDCs requires not only technological infrastructure but also a robust legal framework capable of addressing issues of privacy, regulatory oversight, and financial stability. The present

study contributes to this discourse by examining the legal preparedness of India's regulatory framework for the introduction of the e-Rupee.

IV. OBJECTIVE 1: EXAMINING LEGAL ISSUES AND CHALLENGES IN INDIA

The introduction of the e-Rupee raises several legal and regulatory considerations within India's existing financial governance framework. However, contrary to earlier concerns regarding the statutory authority of the Reserve Bank of India (RBI) to issue digital currency, the Finance Act, 2022 has already provided the necessary legislative foundation. Through this amendment, the Reserve Bank of India Act, 1934 was modified by expanding the definition of "bank note" under Section 2(a)(iv) to include banknotes issued in digital form. When read together with Section 22 of the RBI Act, which grants the RBI the exclusive authority to issue banknotes, this amendment explicitly empowers the central bank to issue a Central Bank Digital Currency. Consequently, the digital rupee enjoys the same legal status as physical currency under Section 26 of the RBI Act, which provides that banknotes issued by the RBI are legal tender.

Despite this statutory recognition, several regulatory and governance challenges remain. The Payment and Settlement Systems Act, 2007, which regulates payment infrastructure and settlement mechanisms in India, was originally designed for payment intermediaries and private payment systems rather than for a sovereign digital currency issued directly by the central bank. As a result, questions remain regarding the appropriate regulatory architecture for CBDC wallets, settlement finality mechanisms, and institutional oversight in a digital currency ecosystem.

Further legal considerations arise from the intersection of CBDC operations with other regulatory statutes. For instance, the Information Technology Act, 2000 governs electronic records and cybersecurity obligations, which are directly relevant to digital currency infrastructure. Similarly, the Prevention of Money Laundering Act, 2002 (PMLA) imposes obligations relating to transaction monitoring, reporting of suspicious activities, and anti-money laundering compliance—functions that would necessarily apply to institutions facilitating CBDC transactions. The Foreign Exchange

Management Act, 1999 (FEMA) may also become relevant in the context of cross-border digital currency transfers and international payment arrangements involving the e-Rupee.

In addition to statutory coordination, constitutional considerations remain central to the legal discourse on CBDCs. The creation of a traceable digital currency raises potential concerns under the right to privacy recognised under Article 21 of the Constitution, as affirmed by the Supreme Court in Justice K.S. Puttaswamy (Retd.) v. Union of India. Although the Digital Personal Data Protection Act, 2023 establishes a framework for the protection of personal data, it does not specifically address the unique data governance challenges associated with CBDC transaction records.

Accordingly, the primary legal challenge for India is no longer the absence of statutory authority to issue a CBDC, but rather the need to develop a comprehensive regulatory framework governing CBDC architecture, privacy safeguards, consumer protection mechanisms, and interoperability with existing financial regulations. Addressing these issues will be essential to ensure that the e-Rupee operates within a coherent legal ecosystem while maintaining public trust in the digital monetary system.

V. OBJECTIVE 2: ANALYSING INDIA'S INFRASTRUCTURE READINESS

India's digital and financial infrastructure presents a mixed report card regarding the support for introducing a Central Bank Digital Currency, such as the e-Rupee. On the credit side, India is well-suited to undertake the rollout of a CBDC, as it has a very advanced digital payments infrastructure. The Unified Payments Interface (UPI) handles over 10 billion monthly transactions, indicating that the nation has the technological capability to execute large-scale, real-time digital payments.[50] Through the Jan Dhan–Aadhaar–Mobile (JAM) trinity, which has enrolled millions of erstwhile unbanked in the organised financial system, India has a robust foundation for adopting CBDC. These initiatives have created a consumer base that is tech-savvy, which facilitates the introduction of a digital currency backed by the government.

[50] Supra note 11.

But there are still important weaknesses that need to be fixed. Proposing the e-Rupee to be an online only tool may deprive a large segment of the population of their access to the internet, which is still an ongoing concern in rural areas where internet penetration is at roughly 40% compared to over 70% in metropolitan cities.[51] As an autonomous monetary system, the e-Rupee would be at the perfect range for a targeted fraud or hack and even a potential systemic risk. India's cyber defences must be significantly strengthened in order to effectively prevent hacking and data breaches that could undermine public trust.

India's digital and financial infrastructure provides a favourable foundation for the phased introduction of the e-Rupee, supported by large-scale initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) and the Jan Dhan–Aadhaar–Mobile (JAM) trinity. As of recent government and RBI data, more than 50 crore PMJDY accounts have been opened, significantly expanding formal banking access and strengthening the financial inclusion ecosystem. The RBI Financial Inclusion Index (FI-Index) has also shown steady improvement in recent years, reflecting increased access, usage, and quality of financial services across the country.

At the same time, the growing digitalisation of financial services has been accompanied by a rise in cybersecurity threats and financial fraud incidents targeting digital payment systems. The deployment of a CBDC would therefore require strong cybersecurity architecture and resilient technological infrastructure capable of safeguarding transaction integrity and user data.

Without dedicated investment in digital literacy programmes and robust cybersecurity infrastructure, the deployment of a CBDC risks deepening financial exclusion rather than alleviating it.

[51] Telecom Regulatory Authority of India, Indian Telecom Services Performance Indicator Report (2024).

VI. OBJECTIVE 3: GLOBAL CBDC IMPLEMENTATIONS: LESSONS FOR INDIA

Some countries have developed CBDCs more quickly than India, and their experiences teach us valuable insights.

A. The Bahamas: The Sand Dollar

The world's first digital Bahamian dollar, or CBDC, was introduced in October 2020 as the Bahamian Sand Dollar.[52] Due to the country's unique territory status, which made it costly and challenging to offer ordinary banking services to its remote "Family Islands," it was established in response to the general financial isolation that resulted. It was created to fill this niche, enhance the nation's payment system efficiency, and create financial resilience in the face of natural disasters that may interrupt access to physical banknotes.

Working under a two-level structure, the Central Bank of The Bahamas mints the Sand Dollar. It distributes it to approved financial institutions, which then issue it to citizens through secure mobile wallets. It is a direct central bank liability, pegged at a one-to-one rate with physical currency, and it is actually distinct from decentralised cryptocurrencies.[53] While its novel architecture, as described, presents great promise, its chief challenges remain in stimulating widespread use, which involves overcoming the general public's lack of awareness, merchant acceptance, and closing a gap in digital literacy.[54]

For larger economies thinking about own CBDCs, the Sand Dollar is a substantial, practical example on a global scale. Its implementation offers invaluable insights into how digital currency could be used to get over long-standing economic and geographic barriers. The Bahamas has been a practical template whose trajectory will notably influence the future of digital currency worldwide.

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[52] Jeff John Roberts, The World's First Official Digital Currency Is Here. But Will Anyone Use It?, Fortune (Oct. 21, 2020).
[53] Sand Dollar, Cent. Bank of The Bahamas, https://www.sanddollar.bs/ (last visited Dec. 17, 2025).
[54] Int'l Monetary Fund, The Bahamas: 2021 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for The Bahamas, IMF Country Report No. 2021/249, at 11 (Nov. 2021).

B. Nigeria: The eNaira

In October of 2021, Nigeria became the first African country to issue a CBDC with its eNaira. It was created to address major economic issues by driving financial inclusion for its large unbanked community, formalising its cash-based economy, and providing a state-licensed, initial blockchain-based cryptocurrency.[55]

The eNaira has been characterised by remarkably poor public acceptance despite such high hopes. While it was projected that barely a little over 0.5% of Nigerians used the CBDC in a year since being introduced, the core reason for its initial failures to offer competitiveness is the fact that its established fintech system is easily accessible to its citizens already.

The development of the eNaira is a crucial lesson for other nations that contemplate CBDCs. Its disappointments illustrate that a technological revolution by itself will not be enough to drive adoption, according to the International Monetary Fund, a weak, initial value proposition, for citizens being a key barrier to success is a major obstacle to success.[56] The Nigerian experiment suggests that a CBDC will need to address a significant challenge and offer clear value that no other alternative can provide to succeed.

C. China: Digital Yuan (e-CNY)

China's Digital Yuan, also known as e-CNY, is among the most advanced Central Bank Digital Currency (CBDC) pilots globally. Its main local goal is to re-establish state control over a private-dominant electronic payments market that has been led by private companies such as WeChat Pay and Alipay.[57] The system features a form of "controllable anonymity," enabling the People's Bank of China (PBOC) to track transactions to fight illegal use while still ensuring that a level of privacy between consumers remains intact.[58]

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[55] Ananya Kumar & Josh Lipsky, What Nigeria's eNaira Gets Right and Wrong, Atlantic Council (Nov. 16, 2021).
[56] Jack Ree, Nigeria's eNaira, One Year After, IMF Fintech Notes No. 2023/001, at 4 (Mar. 2023).
[57] People's Bank of China Working Grp. on E-CNY Rsch. & Dev., Progress of Research & Development of E-CNY in China 6 (July 2021).
[58] Id.

Apart from home policy, the e-CNY also features prominently in China's international policy. It helps to create a system for cross-border payments that bypasses US-controlled SWIFT, thereby reducing exposure to financial sanctions and stimulating the global use of the renminbi.[59] It has been tested in large-scale pilots involving hundreds of millions of users, including a demonstration at the 2022 Beijing Winter Olympics.[60]

Though at an advanced level the e-CNY faces fierce rivalry coming from the convenience of existing payment apps. Its built-in surveillance features also raise serious privacy concerns, which further limits its widespread appeal. Nonetheless, its meteoric rise has acted as a global model for furthering CBDC research and fostering an international dialogue about the future of information, money, and geopolitics.

VII. OBJECTIVE 4: LESSONS FROM GLOBAL CBDC EXPERIMENTS

India's e-Rupee can learn practical lessons from the global implementation of CBDCs, especially with regard to design decisions, adoption, and privacy issues.

1. First, the Sand Dollar in the Bahamas serves as an example of how offline payment capabilities are crucial to attaining coverage in areas with sporadic access. Reach to users in remote locations is greatly increased by technical design choices that enable store-and-forward or card-based offline payment capabilities.[61]
2. Secondly, Nigeria's eNaira experience demonstrates that operational continuity alone does not translate into adoption; a clear and compelling value proposition for users, supported by effective public awareness initiatives and seamless integration with existing payment systems, is essential to encourage widespread usage.[62]
3. Thirdly, China's e-CNY demonstrates how large-scale pilots can integrate CBDCs with an existing super-app ecosystem and incorporate programmable

[59] Gerard DiPippo & Andrea Leonard Palazzi, China's Digital Yuan: The E-CNY's Limitations and Future, CSIS (Feb. 15, 2023).
[60] Raphael Auer, et al., e-CNY after the Beijing Winter Olympics, BIS Bulletin No. 54, at 1 (June 2022).
[61] Supra note 22.
[62] Jookyung Ree, Nigeria's eNaira, One Year After, IMF Working Paper No. WP/23/104 (May 2023). IMF

features. Nevertheless, it also reveals the privacy and surveillance compromises that occur when transaction information is shared with state functionaries.[63]

4. Fourthly, cross-authority research studies and policy collaboration across jurisdictions (as seen in BIS reports) emphasise that CBDC design must strike a balance between speed, resilience, and connectivity, mainly if the currency needs to promote cross-border payments, and that central banks must examine implications for monetary policy as well as financial stability relatively early in design work.[64]

All things considered, they indicate four practical priorities for the e-Rupee: creating strong offline coverage options, developing a compelling value proposition to go along with UPI, enforcing stringent privacy controls with limited access to transaction data, and creating interoperability across national borders while putting financial and cyber resiliency to the test.

VIII. SUGGESTIONS AND RECOMMENDATIONS

For the successful and legally sound implementation of the e-Rupee, several policy and legislative measures should be considered.

1. Legislative amendments are necessary to provide explicit statutory recognition to the e-Rupee as a form of legal tender. The Reserve Bank of India Act, 1934 should be amended to broaden the definition of "banknotes" or introduce a specific provision recognising digital currency issued by the RBI. Similar amendments may also be required in the Payment and Settlement Systems Act, 2007, to ensure legal clarity regarding settlement finality and the enforceability of digital currency transactions.
2. A robust privacy and data governance framework must accompany the rollout of the CBDC. While the Digital Personal Data Protection Act, 2023 represents

[63] Atlantic Council, Missing Key: The Challenge of Cybersecurity and Central Bank Digital Currency (Jun. 2022), https://www.atlanticcouncil.org/wp-content/uploads/2022/06/Missing_key.pdf. Atlantic Council

[64] "Central Bank Digital Currency Adoption," IMF Working Paper (2024), by N. Tsuda et al., Fundamental Review Note on Global CBDCs, referencing Sand Dollar's adoption challenges.

an important step toward safeguarding personal data, CBDC systems involve transaction-level information that may reveal sensitive behavioural patterns. Clear regulatory safeguards should therefore be introduced to ensure that access to transaction data remains limited, proportionate, and subject to strict oversight.

3. Offline transaction capabilities should be incorporated into the design of the e-Rupee. International experiences, particularly the Bahamas' Sand Dollar, demonstrate that offline payment mechanisms can significantly expand accessibility in regions with limited internet connectivity. Introducing store-and-forward or card-based offline functionality would ensure that the CBDC remains usable even in rural or low-connectivity areas.
4. Public adoption strategies must accompany technological deployment. Lessons from Nigeria's eNaira show that technological innovation alone cannot guarantee widespread usage. Public awareness programmes, merchant incentives, and seamless interoperability with existing digital payment platforms such as the Unified Payments Interface (UPI) will be essential to ensure meaningful adoption.
5. India should pursue international cooperation on CBDC interoperability standards. As global CBDC experimentation continues, cross-border payment frameworks may emerge that enable faster and more efficient international transactions. India's participation in these collaborative initiatives could enhance the long-term utility of the e-Rupee within the global financial system.

By implementing these measures, India can develop a CBDC framework that is not only technologically advanced but also legally robust, privacy-respecting, and inclusive.

IX. CONCLUSION

The emergence of the e-Rupee marks a pivotal moment in India's transition toward a digitally driven financial system. While the concept of a Central Bank Digital Currency promises significant advantages including improved payment efficiency, enhanced

financial inclusion, and stronger monetary sovereignty its successful implementation depends on addressing a range of legal, regulatory, and infrastructural challenges.

This study demonstrates that the current legal framework governing currency issuance and payment systems in India does not explicitly accommodate a sovereign digital currency. Legislative clarification, particularly through amendments to the Reserve Bank of India Act, 1934 and related financial statutes, will therefore be essential to formally recognise the e-Rupee as legal tender and ensure the enforceability of digital transactions. At the same time, the constitutional implications of CBDC implementation especially with respect to privacy rights and data protection require careful consideration in light of evolving digital governance norms.

India's strong digital ecosystem, supported by initiatives such as UPI and the JAM trinity, provides a favourable foundation for the gradual rollout of the e-Rupee. Nevertheless, concerns relating to cybersecurity, digital literacy, and rural connectivity must be addressed to avoid the risk of financial exclusion.

Lessons drawn from international CBDC experiments illustrate that technological capability alone cannot guarantee adoption. Instead, a successful CBDC framework must combine legal certainty, public trust, privacy safeguards, and practical usability. If implemented through a carefully structured regulatory approach, the e-Rupee has the potential to complement India's existing digital payment architecture while reinforcing the stability and inclusiveness of its financial system.

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 (ISSN: 2583-7753)