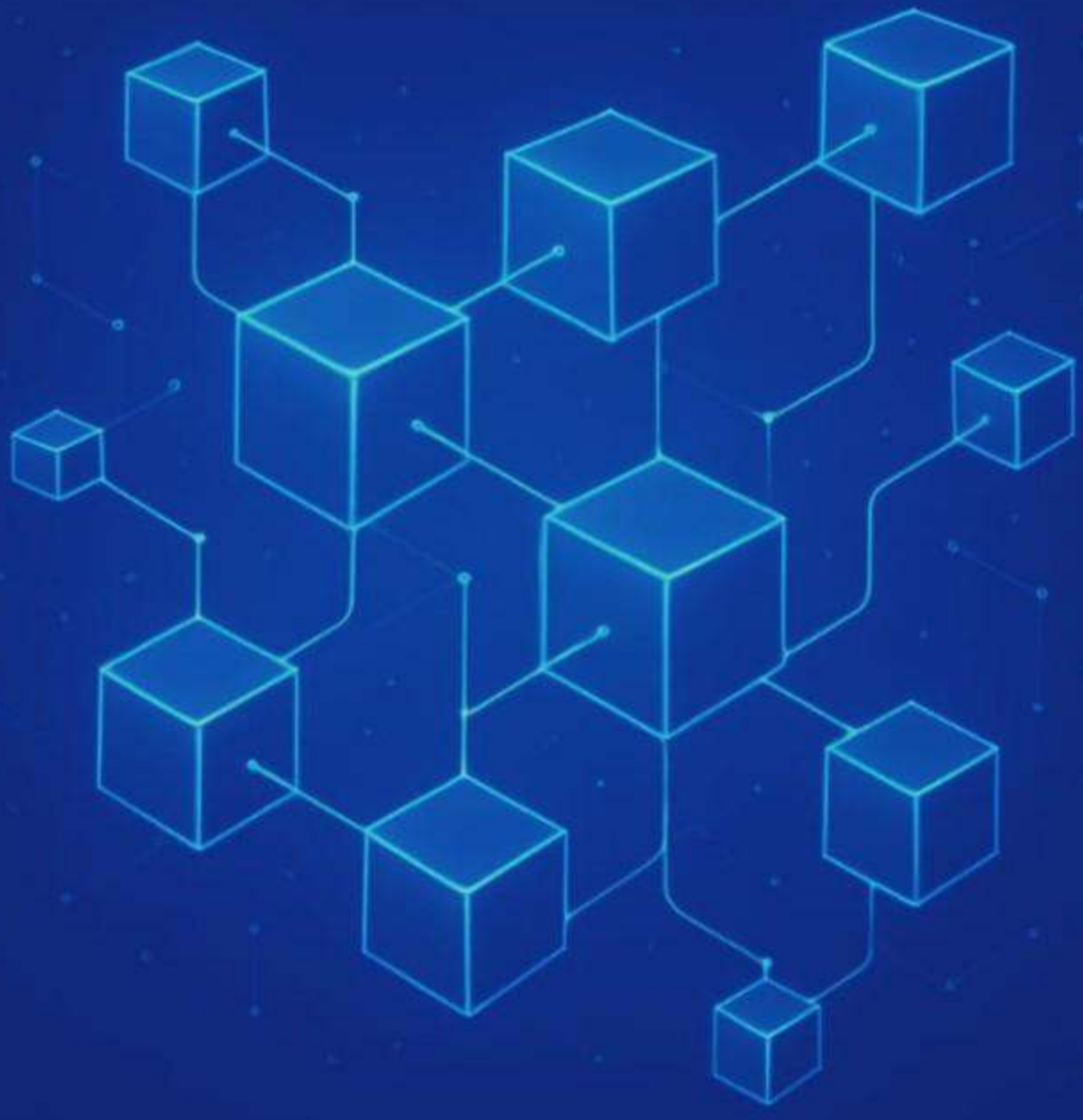
BLOCKCHAIN IN BUSINESS TRANSFORMATIVE TRENDS IN COMMERCE



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REVOLUTIONIZING INDIAN AGRI-SUPPLY CHAINS: BLOCKCHAIN IN COFFEE BOARD AND APEDA INITIATIVES

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1.1 INTRODUCTION

The Indian agricultural export sector is experiencing a digital transformation, with blockchain technology playing a crucial role in enhancing transparency and efficiency (Dutta et al., 2020). As globalization continues to rise and supply chain networks become more complex, supply chain management (SCM) has become vital for businesses across various industries (Khan et al., 2019). Traditional supply chains frequently face challenges such as inefficiencies, limited transparency, and security risks (Xu et al., 2019). This chapter focuses on the implementation of blockchain in two major agri-export initiatives: the Coffee Board of India's blockchain-enabled marketplace and APEDA's integration of blockchain within the Grape Net system. These government-led projects aim to enhance traceability, eliminate intermediaries, ensure fair pricing for farmers, and foster global trust in Indian agricultural products. By utilizing the blockchain, both initiatives are enhancing the credibility of Indian coffee and grape exports, promoting sustainability, and strengthening India's position in international markets (Kumar et al., 2025)

1.2 BLOCKCHAIN TECHNOLOGY

Blockchain is a distributed, decentralized, public, and immutable ledger that records transactions across numerous computers (Dutta et al., 2020). Instead of depending on a central authority, it operates through a peer-to-peer network, where every participant maintains a copy of the ledger.

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Initially created for cryptocurrency transactions, blockchain has since been adopted in various sectors due to its ability to securely, transparently, and tamper-proofly record data. Within a blockchain network, each transaction is time-stamped and linked to prior transactions, forming an unchangeable chain of data blocks. In supply chains, every step from raw material extraction to the final delivery to consumers is permanently recorded and accessible to authorized participants (Kumar et al., 2025).

1.3 COFFEE BOARD OF INDIA

The Coffee Board of India, under the Ministry of Commerce and Industry, plays a crucial role in supporting coffee cultivation, research, marketing, and export. In an effort to modernize and increase the transparency of the coffee supply chain, the Board adopted blockchain technology. A blockchain-based marketplace app has been developed to enhance transparency in the trade of Indian coffee. This app aims to maintain traceability from bean to cup, ensuring that consumers enjoy authentic Indian coffee while growers receive fair compensation for their products.

This initiative seeks to create a strong brand image for Indian coffee by reducing growers' reliance on intermediaries, allowing them direct access to buyers for fair pricing. It also helps exporters find suitable coffee suppliers within a timely manner to meet increasing demand and fosters trust and long-term relationships through improved visibility and transparency in the supply chain. The platform is designed to help farmers achieve better prices by eliminating agents and other middlemen.

In March 2019, the Coffee Board of India launched a pilot blockchain-based e-marketplace aimed at connecting coffee farmers with markets, enhancing transparency, and ensuring fair prices for producers. This project was implemented in collaboration with Eka Software Solutions.

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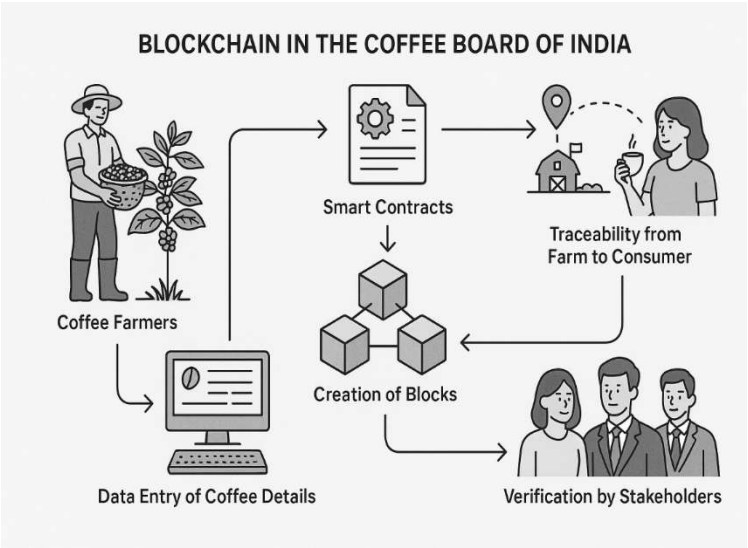

Figure: 1

Working of Blockchain in the Coffee Board of India

1.3.1 OBJECTIVES

- **Transparency:** The project aims to ensure complete visibility throughout the coffee supply chain, allowing all stakeholders to trace the journey of coffee from farm to cup. By preventing data tampering, the system guarantees authenticity and fosters trust among participants.
- **Fair Pricing:** By directly connecting farmers with buyers, this initiative seeks to eliminate middlemen, empowering farmers to secure better prices for their produce and enhancing their economic stability.
- **Quality Assurance:** The Coffee Board is committed to certifying the quality of coffee beans, with this information recorded on the blockchain for easy verification. This reinforces consumer confidence in the quality of Indian coffee.
- **Market Access and Brand Value:** The Coffee Board aims to position Indian coffee as a premium, traceable product in global markets. By utilizing blockchain technology, it seeks to boost brand recognition

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and meet the increasing international demand for transparency in sourcing.

TABLE 1

IMPACT OF BLOCKCHAIN IN COFFEE SECTOR

Metric	Before Blockchain	After Blockchain (2023 - 24)
Registered farmers on platform	~23 farmers, 100 tonnes	~30,000 farmers
Increase in registered coffee farmers	-	+30,000
Rise in farmer income	-	+43% (Karnataka pilot)
Coffee export value (FY 2020-21 to 23- 24)	USD 719M	USD 1.29B
Export value growth in June 2024	Baseline	+70% Year over Year contribution from coffee

1.4 BLOCKCHAIN ADOPTION IN APEDA

The Agricultural and Processed Food Products Export Development Authority (APEDA) has integrated blockchain technology into its GrapeNet system to enhance traceability, security, and efficiency in the export value chain, particularly for fresh grapes exported from India to the European Union.

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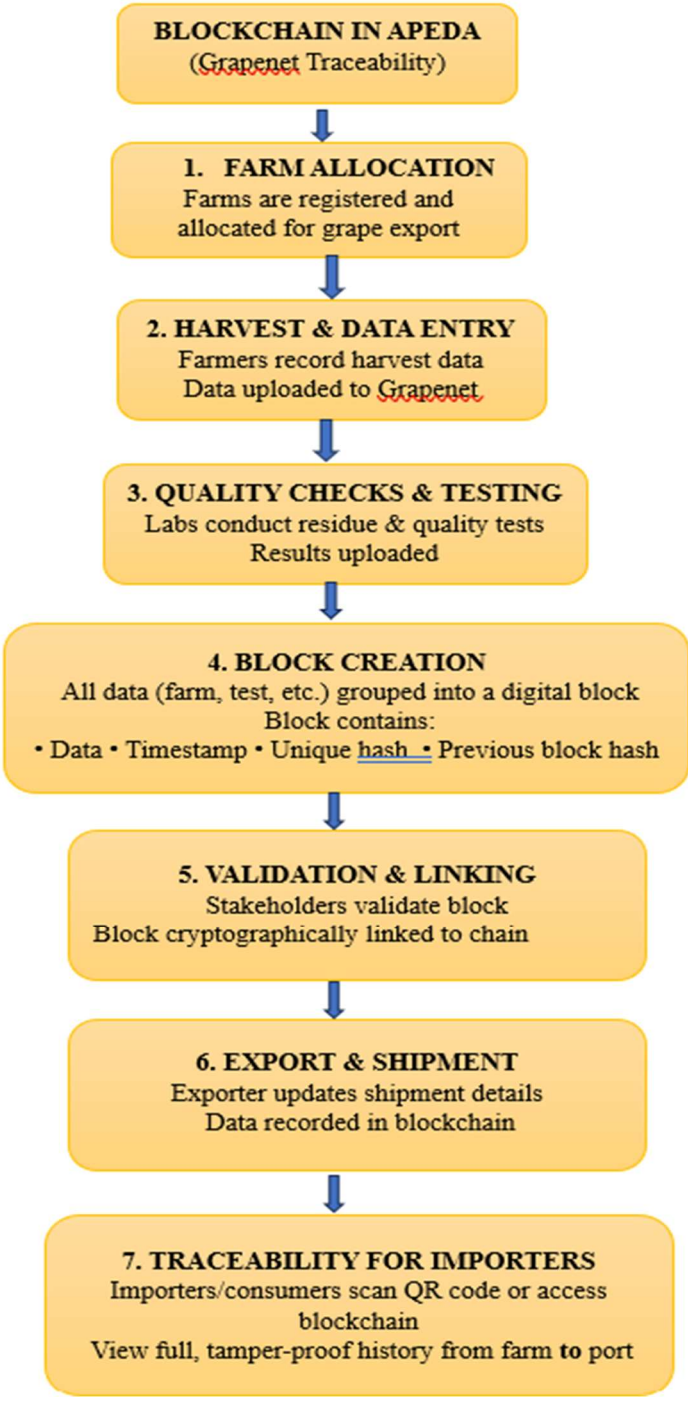

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1.4.1 IMPACT OF BLOCKCHAIN IN APEDA

- **Enhances Traceability:** Blockchain enables APEDA to monitor every stage of grape production, from farm allocation to customer delivery. This system allows for precise tracking of each consignment back to its specific farm plot, ensuring authenticity and adherence to quality standards.
- **Enhances Data Security and Transparency:** With blockchain, there is an immutable and shared ledger that can only be accessed by authorized network members. This guarantees that all recorded transactions are tamper-proof and transparent, fostering trust among stakeholders and importers.
- **Efficiency and Cost-effectiveness:** Implementing blockchain technology, alongside cloud migration, creates a scalable and cost-efficient framework for all participants in the export chain. This approach reduces the risk of data breaches and lessens administrative costs.
- **Stakeholder Confidence and Market Expansion:** International buyers, particularly in the EU, gain the ability to verify the origin and quality of Indian produce, thereby enhancing trust and potentially expanding market opportunities for Indian exporters.

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TABLE 2

Criteria	*Coffee Board of India*	*APEDA (GrapeNet)*
Crop	Coffee	Fresh Grapes
Blockchain Role	E-Marketplace for traceability & fair trade	Export documentation and farm-to - port tracking
Technology Partner	Eka Software Solutions	Trace X, IBM
Target Market	Global coffee buyers	European Union
Farmer Impact	Price realization, market access	Certification, export readiness

COMPARISON: COFFEE BOARD Vs APEDA INITIATIVES

CONCLUSION

Blockchain technology is redefining India's agricultural export landscape by enhancing transparency, traceability, and trust. The initiatives by the Coffee Board and APEDA illustrate how digital innovation can empower farmers, reduce intermediaries, and improve market access. While challenges remain, these projects offer a scalable model for transforming agri-supply chains and positioning Indian produce competitively in global markets.

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REFERENCES

- APEDA. (2024). *APEDA upgrades the GrapeNet blockchain system*. https://e-startupindia.com/learn/apeda-upgrades-the-grapenet/
- Cognixia. (2019, November 21). *How is Blockchain helping Indian coffee-growers?* https://www.cognixia.com/blog/how-is-blockchain-helping-indian-coffee-growers/
- Dutta, P., Choi, T. M., Somani, S., & Butala, R. (2020). Blockchain technology in supply chain operations: Applications, challenges and research directions. *Transportation Research Part E: Logistics and Transportation Review*, *139*, 101966.
- https://e-startupindia.com/learn/apeda-upgrades-the-grapenet/
- https://supplychaindigital.com/procurement/indian-coffee-board-launches-blockchain-marketplace-improve-supply-chain
- https://www.downtoearth.org.in/agriculture/guess-what-s-helping-indian-coffee-blockchain-67571?utm_source=chatgpt.com
- https://www.ibef.org/exports/coffee-industry-in-india
- Khan, S. A. R., Yu, Z., Rehman Khan, S. A., & Yu, Z. (2019). Introduction to supply chain management. *Strategic Supply Chain Management*, 1–22.
- Kumar, R., Patel, S., & Iyer, L. (2025). *Decentralized solutions for smart supply chains*. Emerging Technologies in Business, 14(2), 73–89.
- PIB. (2020). *Press Information Bureau Government of India – Coffee Board Blockchain Initiative*. https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1698183
- Supply Chain Asia. (2019, March 30). *India to use blockchain to improve coffee supply chain*. https://supplychainasia.org/india-use-blockchain-improve-coffee-supply-chain/

- Wang, M., Wu, Y., Chen, B., & Evans, M. (2020). Blockchain and Supply Chain Management: A New Paradigm for Supply Chain Integration and Collaboration. *Operations and Supply Chain Management: An International Journal*, *14*(1), 111-122. Webisoft. (2024). *16 Disadvantages of Blockchain: Limitations and Challenges*. [https://webisoft.com/articles/disadvantages-of-blockchain/]
- Xu, L., Xu, E., & Li, L. (2019). Industry 4.0: State of the art and future trends. *International Journal of Production Research*, *56*(8), 2941–2962.