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Sustainable Agriculture

for a RESILIENT AND FOOD-SECURE FUTURE

Journal of

ICMAI
THE INSTITUTE OF
COST ACCOUNTANTS OF INDIA
भारतीय लागत लेखाकार संस्थान
Statutory Body under an Act of Parliament
(Under the jurisdiction of Ministry of Corporate Affairs)

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- **THE INSTITUTE OF COST ACCOUNTANTS OF INDIA** (erstwhile The Institute of Cost and Works Accountants of India) was established in 1944 as a registered company under the Companies Act with the objects of promoting, regulating and developing the profession of Cost Accountancy.
- On 28 May 1959, the Institute was established by a special Act of Parliament, namely, the Cost and Works Accountants Act 1959 as a statutory professional body for the regulation of the profession of Cost & Management Accountancy.
- It has since been continously contributing to the growth of the industrial and economic climate of the country.
- The Institute of Cost Accountants of India is the only recognized statutory professional organisation and licensing body in India specialising exclusively in Cost & Management Accountancy.

VISION STATEMENT

"The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally."

MISSION STATEMENT

"The CMA Professionals would ethically drive enterprises globally by creating value to stakeholders in the socio-economic context through competencies drawn from the integration of strategy, management and accounting."

Institute Motto

असतोमा सद्गमय तमसोमा ज्योतिर् गमय मृत्योर्मामृतं गमय ॐ शान्ति शान्ति शान्तिः	From ignorance, lead me to truth From darkness, lead me to light From death, lead me to immortality Peace, Peace, Peace

IDEALS THE INSTITUTE STANDS FOR

- to develop the Cost and Management Accountancy Profession
- to develop the body of members and properly equip them for functions
- to ensure sound professional ethics
- to keep abreast of new developments

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Behind every successful business decision, there is always a CMA

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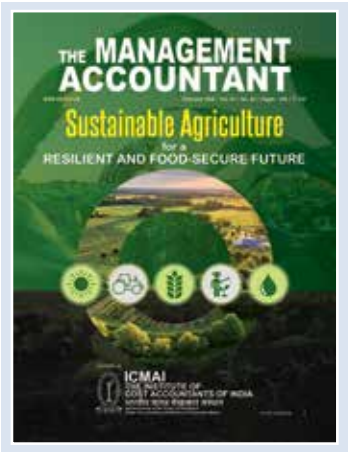
February 2026



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THE COUNCIL

From the EDITOR'S DESK

Sustainable Agriculture for a Resilient and Food-Secure Future

Sustainable agriculture lies at the core of achieving a resilient and food-secure future, particularly in the face of growing challenges such as climate variability, soil degradation, and increasing water stress that threaten agricultural productivity. The adoption of climate-smart agricultural practices including crop diversification, efficient irrigation systems, regenerative soil management and digital agri-advisory services has become imperative rather than optional. Strengthening farmers' access to innovation, affordable finance and resilient infrastructure will be critical in enabling agriculture to meet the nutritional needs of a growing population while safeguarding natural resources for future generations.

The Union Budget 2026–27 reinforces this strategic vision by placing renewed emphasis on sustainability, resilience and farmer welfare. Enhanced investments in agricultural infrastructure, climate-resilient farming practices, value-chain development and rural livelihoods signal a decisive shift from short-term productivity gains toward long-term food security. Continued support for agri-technology, natural farming initiatives and risk-mitigation mechanisms underscores the recognition that resilient agriculture is fundamental to economic stability, nutritional security, and inclusive growth. Effective alignment between policy frameworks and on-ground implementation has the potential to transform Indian agriculture into a sustainable and future-ready engine of development.

Glimpses of the Articles Covered in This Issue

- *Issues and Challenges Faced by Farmers in Sustainable Agriculture*

  This study examines key issues and challenges faced by small farmers cultivating commercial crops across six districts of Tamil Nadu, India. It highlights the critical role of Cost Accountants in addressing these challenges through improved cost management and financial planning.

- *Cost Optimization in Farm Operations*

  This article explains the importance of cost optimization in the agricultural sector and outlines practical approaches for achieving efficiency and sustainability in farm operations.

- *Sustainable Agriculture for a Resilient and Food-Secure India: The Strategic Role of CMAs*

  The paper concludes that sustainable agriculture, supported by robust costing systems and sound governance practices, will be the cornerstone of India's resilient agricultural future.

- *Cost-Benefit Analysis of Sustainable Agricultural Technologies: An Indian Management Accounting Perspective*

  This study evaluates the financial viability of selected sustainable agricultural technologies, including integrated pest management (IPM), drip irrigation, organic nutrient management, precision farming, and renewable energy adoption, using cost-benefit analysis.

- *Transformation of Agriculture into Sustainability – Use of Technological Advances*

  This paper underscores the need for transforming agriculture through advancements in science and technology, demonstrating how AI, ML, IoT, and data analytics enable smart farming solutions to address food security and climate change challenges globally.

- *Global Money, Global Goals: Rethinking Transnational Finance for the SDGs*

  The article emphasizes the growing importance of climate finance as a powerful instrument in combating climate change and advancing the Sustainable Development Goals through innovative financial structures.

- *Adoption of Activity-Based Costing in Indian Agri-Businesses: An Empirical Study on Cost Accuracy and Managerial Decision-Making*

  This empirical study extends management accounting literature to the agribusiness sector, offering valuable insights into cost accuracy and improved managerial decision-making.

In addition to the thematic articles, this issue includes highlights of the Union Budget 2026–27, a Book Review, an exclusive interview with CMA L. V. S. Sudhakar Babu, Managing Director, Sagarmala Finance Corporation Limited, New Delhi, and several other contemporary articles.

This issue has been curated with the reader at its core, offering insights that are relevant, practical, and forward-looking. The articles aim to support professionals, academicians and practitioners in enhancing their knowledge, sharpening analytical perspectives, and navigating emerging challenges with confidence. We hope this edition serves as a valuable resource in your professional journey and inspires continued learning, critical thinking, and meaningful engagement with the evolving economic and regulatory environment.

Readers are invited to share their feedback at *editor@icmai.in.*

Keep Reading.

President's Communiqué

CMA TCA Srinivasa Prasad
President
The Institute of Cost Accountants of India

We want deeper sincerity of motive, a greater courage in speech and earnestness in action.

Smt. Sarojini Naidu

My Dear Professional Colleagues,

Namaskaar!

Warm greetings are extended to all stakeholders as we continue the journey of progress and purpose. Recent developments reflect a strong culture of professionalism, collaboration and commitment across all levels, reinforcing confidence in the Institute's direction and collective capabilities. The focus remains on translating strategic intent into meaningful outcomes while building on the strong foundations already in place. Every effort and contribution plays a significant role in strengthening institutional resilience, enhancing value creation and advancing shared objectives. With sustained dedication and unity of purpose, the path ahead holds significant opportunities for professional growth, impact and higher benchmarks of achievement.

Union Budget 2026

ICMAI conveys its sincere appreciation to the Government of India for the progressive and forward-looking Union Budget 2026, which reflects a balanced approach towards inclusive growth, fiscal discipline and long-term economic resilience. The continued emphasis on infrastructure development, manufacturing and MSME support, digital transformation, sustainability and human capital development is commendable and aligns well with the national vision of a developed India.

ICMAI appreciates the policy measures aimed at enhancing ease of doing business, strengthening domestic competitiveness, ensuring efficient public expenditure and reaffirms its commitment to support the Government's nation-building initiatives through professional expertise and advisory support.

Corporate Mitras in tier 2 and 3 cities

ICMAI expresses its sincere gratitude to the Government and Hon'ble Finance Minister for proposing in the Union Budget 2026 to support professional bodies like ICAI, ICSI and ICMAI to create short-term modular courses and practical tools, aiming to develop a pool of 'Corporate Mitras' in tier 2 and 3 cities.

ICMAI assures the Government of its wholehearted and all-out support in this endeavour and remains committed to leveraging its expertise and nationwide network to build a strong pool of skilled 'Corporate Mitras', particularly in Tier-2 and Tier-3 cities, thereby contributing meaningfully to inclusive economic growth and capacity building.

63rd National Cost and Management Accountants' Convention (NCMAC) 2026

The Institute successfully organised the 63rd National Cost and Management Accountants' Convention (NCMAC) 2026 from 9th to 11th January 2026 in Coimbatore, Tamil Nadu, under the theme "***RISE India – Reposition India and CMAs, Intensify Growth, Strengthen Competence & Enhance Capabilities***." The three-day convention provided a strategic and future-oriented roadmap to position Cost and Management Accountants (CMAs) as critical enablers of India's economic

transformation in alignment with the national vision of Viksit Bharat 2047. Coimbatore's strong industrial legacy and innovation-driven ecosystem aptly complemented the convention's objectives.

The Hon'ble Vice President of India, Shri C.P. Radhakrishnan, in his message, acknowledged ICMAI's nation-building role in strengthening cost competitiveness, governance and financial discipline and expressed confidence that the deliberations would yield actionable outcomes supporting inclusive and sustainable growth.

The convention featured high-impact inaugural and plenary sessions, followed by intensive technical discussions on Industry 5.0, ESG-led transformation, digital finance, AI-enabled cost management, sustainability and innovation leadership. With over 1,000 participants including policymakers, regulators, corporate leaders, public sector executives and international professionals, the NCMAC 2026 underscored the expanding strategic role of CMAs across manufacturing and service sectors. A major highlight was the release of ICMAI's Technical Guide on Cost Management in the Healthcare Services, along with several important publications across Taxation, BFSI, MSMEs and Start-ups, reinforcing the Institute's commitment to evidence-based policy and sectoral efficiency. Eminent leaders emphasised the importance of Total Cost Management, sustainability integration, advanced manufacturing and digital governance in enhancing India's global competitiveness.

The 63rd NCMAC 2026 emerged as a defining milestone, reinforcing the CMA brand as a trusted voice in governance, growth and national development and issuing a collective call to action for CMAs to actively contribute to India's journey towards Viksit Bharat 2047. The successful conduct of the 63rd NCMAC 2026 stands as a testament to the collective dedication and meticulous efforts of the Convention Committee and other Organising Committees, the Southern India Regional Council, the Coimbatore Chapter, officials of the Institute and the committed volunteers whose untiring support ensured a truly landmark event. Sincere appreciation is extended to the esteemed speakers, partners from government and industry, valued sponsors and all participants whose engagement, insights and support significantly enriched the deliberations and contributed to the overall success of the Convention.

Republic Day Celebrations

The 77th Republic Day of the nation was celebrated with fervour and joy in the offices of the Institute across India on 26th January 2026.

- **At Headquarters Delhi,** CMA Neeraj D Joshi, Vice-President of the Institute unfurled the tricolour in the presence of CMA Manoj Kumar Anand and CMA Navneet Kumar Jain, Council Members of the Institute, CMA Rakesh Yadav, Chairman, ICMAI-NIRC, CMA Honey Singh, Secretary, ICMAI-NIRC and CMA Jeevan Chandra, ICMAI-NIRC. Former President and officials of the Institute also joined the Republic Day celebrations in Delhi.
- CMA Neeraj D Joshi, Vice-President of the Institute unfurled the national flag in **Noida Office of the Institute** in the presence of CMA Navneet Kumar Jain, Council Member, ICMAI and CMA Jeevan Chandra, ICMAI-NIRC. Officials of the Institute and ICMAI-IPA & ICMAI-RVO, section 8 Companies of the Institute also joined the Republic Day celebrations in Noida.
- The undersigned unfurled the National Flag at the **Kolkata Office of the Institute** in the presence of CMA Chittaranjan Chattopadhyay and CMA Avijit Goswami, Council Members of the Institute and CMA Arati Ganguly, Chairperson of ICMAI-EIRC. Floral tributes were paid to Swami Vivekananda and Netaji Subhas Chandra Bose. Former Presidents, officials of the Institute and members also joined the 77th Republic Day celebrations in Kolkata on 26th January 2026.
- The undersigned unfurled the National Flag in the premises of the **ICMAI-EIRC** in the presence of CMA Arati Ganguly, Chairperson of ICMAI-EIRC, CMA Chittaranjan Chattopadhyay, CMA Avijit Goswami, Council Members of the Institute and CMA Abhijit Dutta, Secretary of ICMAI-EIRC. Former Presidents of the Institute and Former Chairmen and RCMs of EIRC along with

many members of the Institute joined the 77th Republic Day celebrations at EIRC premises in Kolkata.

The ceremonies reflected the spirit of unity, discipline and national pride. The gathering paid homage to the freedom fighters and constitutional framers who laid the foundation of the Republic of India. Addressing the participants during the above mentioned ceremonies, the undersigned and the Vice-President emphasized the role of professionals in nation-building and urged all members and officials of the Institute to uphold the highest standards of integrity, professionalism and service to the nation.

SSB organised Sustainability Summit 2.0

The Sustainability Standards Board (SSB), ICMAI organised the Sustainability Summit 2.0 on 29th January 2026 in Noida, bringing together national and international leaders to deliberate on sustainability and the evolving role of the profession. The Summit was graced by Mr. Lee White, CEO, IFAC as the Chief Guest, with Mr. Laxman Watawala, President, CMA Sri Lanka and former President, SAFA and Ms. Jennifer Lopez, CEO, CAPA, as Guests of Honour in the presence of CMA Neeraj D Joshi, Vice-President, ICMAI, CMA Dr Ashish P Thatte, Chairman, SSB and other Council Members of the Institute.

Delivering the Presidential address in the inaugural session the undersigned highlighted the foundational role CMAs play in sustainability by ensuring credible measurement, reliable assurance, integrity-driven reporting and monitoring.

A key highlight was the launch of the 1st ICMAI Green Awards 2023–24, recognising excellence in sustainability practices across large, mid and small-cap companies, along with the felicitation of Best Article Awards under Sukhinobhavantu and the release of important sustainability publications. The technical sessions featured panel discussions and expert presentations on sustainable economy, environmental and social aspects of sustainability reporting and emerging opportunities for CMAs, with participation from regulators, industry leaders, practitioners, academics and international bodies, making the Summit a comprehensive platform for advancing sustainability discourse.

SSB Conclave in Hyderabad

A joint conclave on the theme *IFSC enabled Global Platform for Indian Enterprise - Direct Listing and Sustainable Finance* was organised by the Sustainability Standards Board (SSB), ICMAI in association with the ICMAI-Hyderabad Chapter in its Sanathnagar office, on 23rd January 2026. Shri K. Rajaraman, IAS, Chairman, IFSCA, addressed the participants virtually, while CMA (Dr.) Ashish P. Thatte, Chairman, SSB highlighted SSB initiatives during Sustainability Month. CMA (Dr.) KChAVSN Murthy, Council Member, ICMAI, CMA Vijay Kiran Agastya, Chairman, ICMAI-SIRC and CMA Khaja Jalaluddin, Chairman, ICMAI Hyderabad Chapter were also present in the conclave. The conclave featured multiple technical sessions covering IFSCs, start-ups and sustainable finance, including green and sustainability-linked bonds, panel discussions on sustainable finance, insights into the start-up ecosystem and a session on direct listing in IFSCs and the evolving role of CMAs, with participation from senior professionals and subject experts of ICMAI.

International Kolkata Book Fair 2026

The Institute is participating in the International Kolkata Book Fair 2026 being organised during 22nd January to 3rd February 2026. The undersigned visited the Institute's stall in the Book Fair on 26th January 2026 and highlighted the timeless value of reading the books being powerful tools for knowledge creation, critical thinking and personal growth, enabling individuals to broaden their perspectives and stay intellectually enriched in a rapidly changing world. The cultural event and Quiz Competition at the stall provided an engaging platform to witness a vibrant celebration of music, culture and knowledge. CMA Chittaranjan Chattopadhyay, CMA Avijit Goswami and CMA P Vinayaranjan, Council Members of the Institute were also present during the visit to the stall.

RISE India: Leadership Summit 2026 Pune

The Career Counselling & Placement Committee of the Institute, in association with the ICMAI–Pune Chapter, successfully organised the RISE

India: Leadership Summit 2026 in Pune on 30th January 2026, focusing on "Strategic Leadership in Global Capability Centres (GCC): CMAs as Architects of Value Creation." The Summit highlighted the expanding strategic role of Cost and Management Accountants in India's growing GCC ecosystem. Eminent speakers, including industry leaders emphasised leadership readiness, continuous upskilling, ethical practices and emerging competencies for CMAs. The event saw active participation from senior executives and representatives of leading national and multinational organisations across diverse industries, making it a significant platform for industry - profession interaction and strategic dialogue.

CMA Neeraj D Joshi, Vice President, ICMAI highlighted the strategic role of CMAs in driving decision-making, value creation and sustainable growth across Global Capability Centres and large corporates. He emphasised continuous upskilling, ethical leadership and global exposure, while outlining the Institute's initiatives to introduce specialised courses in emerging and technology-driven domains to enhance professional competencies.

CMA P Vinayaranjan, Chairman, Career Counselling & Placement Committee, ICMAI highlighted the increasing importance of Global Capability Centres (GCC) in India's corporate ecosystem and the role of CMAs as key strategic enablers within these organisations. The event was graced by CMA Chaitanya Mohrir, Secretary, ICMAI-WIRC, CMA Shrikant Ippalpalli, Chairman, ICMAI-Pune Chapter and CMA Himanshu Dave, Secretary, ICMAI-Pune Chapter along with other Management Committee Members of the ICMAI-Pune Chapter.

Meeting with IFAC President and CEO

The Institute hosted Mr. Jean Bouquot, IFAC President, Mr. Lee White, IFAC CEO and CAPA CEO- Ms. Jennifer Lopez for a lunch-meet on 31st January 2026 during their visit to India. During the Lunch Meet Up, CMA Neeraj D Joshi, Vice-President and other Council Members, senior members at helm and on key positions in Industry interacted with the international delegates to exchange views on global developments in the cost accountancy profession.

Award Ceremony and PD Seminar in Bhiwani

The undersigned was attended the Award Ceremony and Professional Development Seminar organised by the ICMAI Bhiwani Chapter on 17th January 2026 in Bhiwani, Haryana. The event was graced by Prof. (Dr.) Pawan Kumar, Chairman, Board of School Education Haryana as Chief Guest and Dr. Shiv Shankar Bhardwaj, Former MLA as Guest of Honour, along with CMA MK Anand, Council Member, ICMAI.

Outreach Program on IT Act 2025 in partnership with CBDT

Directorate of Training (DoT), CBDT, Government of India in partnership with the ICMAI has rolled out a Nationwide Outreach Program to ensure a smooth transition to the Income Tax Act, 2025 regime and to educate tax officials, citizens and professionals about key legislative changes. Events and seminars under this Nationwide Outreach Program will be conducted by the Direct Taxation Committee of the Institute is association with Institute's Regional Offices and Chapters across India.

The undersigned had the opportunity to attend one such outreach program organised by ICMAI-Udaipur Chapter in association with ICMAI-NIRC on 18th January 2026 at Udaipur. The program was graced by Dr Anuj Bhatnagar, Deputy Commissioner, SGST-Rajasthan as the Guest of Honour along with CMA Navneet Kumar Jain, CMA Rajendra Singh Bhati, CMA P Vinayaranjan, CMA (Dr.) V Murali, Council Members, ICMAI, CMA Rakesh Yadav, Chairman, ICMAI-NIRC and other RCMs of NIRC and MC members of Udaipur Chapter.

MoU with C.V. Raman University, Khandwa

In a significant development, CMA Chittaranjan Chattopadhyay, Chairman, Agriculture Cost Management Board (ACMB), ICMAI and Dr. Arun R. Joshi, Vice-Chancellor, CVRU, the Institute signed a Memorandum of Understanding to promote professional education and specialized agriculture cost management. The ceremony was attended by dignitaries from ICMAI, ACMB and the

university, marking an important step in integrating cost management standards with higher education.

On this occasion, the *Guidance Note on Farmer Producer Organization (FPO)* developed by ACMB was released. Additionally, ACMB, in association with the Indore Chapter of ICMAI, organized a seminar on *Role of CMAs in FPO & Viksit Bharat 2047* on 17th January 2026 at Indore, further strengthening the role of cost accountants in agricultural development.

MoU with Siva Sivani Institute of Management (SSIM), Hyderabad

The MoU exchange ceremony was held at Siva Sivani Institute of Management (SSIM), Hyderabad on 21st January 2026, in the presence of senior officials from ICMAI and SSIM. The event was graced by CMA Chittaranjan Chattopadhyay, Chairman, BFSI Board, ICMAI, along with CMA (Dr.) KChAVSN Murthy, Council Member, ICMAI, CMA Khaja Jalaluddin, Chairman, ICMAI-Hyderabad Chapter and other distinguished dignitaries and faculty members. As part of the collaboration, 107 students and 3 faculty members enrolled for the Advanced Certificate Course on FinTech, which is scheduled to commence in February 2026.

Membership Initiatives

The month of January 2026 witnessed the grant of 157 new Associate memberships and the up-gradation of 20 Associate members to Fellowship. The newly admitted and upgraded members are extended hearty congratulations and a warm welcome.

Members are reminded that the Certificate of Practice (CoP) for the current financial year remains valid only up to 31st March 2026. To continue as a practicing member, renewal of the CoP for the financial year 2026–27 is mandatory. All practicing members are encouraged to submit their CoP renewal applications after fulfilling the prescribed conditions at the earliest to avoid last-minute congestion and to ensure a smooth and seamless renewal process.

Students who have successfully passed the final examination and possess a minimum of three years of relevant work experience, but have not yet obtained membership, are advised to apply for Associate Membership immediately in order to avail themselves of the full benefits of membership. The application for membership is available online. For ready reference, the relevant link is provided below:

Click Here

CAT DGR Course Batches

CAT Course is being conducted by the Institute in partnership with the Directorate General Resettlement (DGR), Ministry of Defence, Government of India. In January 2026, three new batches of the course commenced at Beawar, Ranchi and Thiruvananthapuram. The Beawar batch was inaugurated on 16th January 2026 in the presence of CMA Rajendra Singh Bhati, Chairman–CAT, while the Ranchi batch was inaugurated in the presence of the DGR officials in hybrid mode. The Thiruvananthapuram batch was started on 27th January 2026. Additionally, two CAT Course batches concluded on 30th January 2026 at Indore and Jaipur. The valedictory function at Indore was addressed virtually by CMA Rajendra Singh Bhati, Chairman–CAT, along with Lt Col Prashant Mishra. The valedictory session at Jaipur was graced by Major Mrityunjay Singh as the Chief Guest.

The Institute remains committed to upholding its values of excellence, integrity and service while continuously working towards the growth and development of the profession. As we move forward together, the Institute extends its heartfelt wishes to all members and students on the auspicious occasions of Maha Shivaratri, Guru Ravidas Jayanti, Swami Dayanand Saraswati Jayanti and Shivaji Jayanti, hoping these celebrations inspire renewed dedication, harmony and purpose in all our endeavours.

Jai Hind!

With warm regards,

CMA TCA Srinivasa Prasad

1st February 2026

BRIEF SUMMARY OF THE ACTIVITIES OF VARIOUS DEPARTMENTS/ COMMITTEES/ BOARDS OF THE INSTITUTE DURING THE MONTH OF JANUARY 2026

CAREER COUNSELLING & PLACEMENT COMMITTEE

CMA National Youth Commerce Olympiad (NYCO 2025-26)

NYCO 2025-26 received an overwhelming response, with over 10,000 students from schools and colleges across the country registering for the Olympiad. The Institute organised NYCO 2025-26 Online Examination through its Career Counselling & Placement Committee and CAT Directorate in support of Directorate of Studies on 31st January 2026.

CMA Winter Campus Placement Programme

The Career Counselling & Placement Committee of the Institute successfully conducted the CMA Winter Campus Placement Programme for newly qualified CMAs of the June 2025 Term at Kolkata and Jaipur. Genpact and Mangalam Arts participated at Jaipur and Garden Reach Shipbuilders & Engineers Limited participated at Kolkata Winter Campus Placement Programme.

DIRECTORATE OF CAT

Results of the CAT Course Examination

The Certificate in Accounting Technicians (CAT) Directorate declared the results of the CAT Course (Part–I) Examination for the December 2025 term on 19th January 2026. Candidates who successfully cleared the examination achieved an important milestone through their dedication and perseverance, making them eligible for direct admission to the Institute's Intermediate Course. They are encouraged to enroll in the CMA Course which offers strong prospects for professional development and long-term career success.

SUSTAINABILITY STANDARDS BOARD

a. Vasudhaiva Kutumbakam Series

- **48th Webinar:** The Board organized the 48th Webinar of the Vasudhaiva Kutumbakam series on 2nd January 2026 from 4 pm to 5:15 pm on the topic "Achieving Sustainability through effective implementation of CSR". CS Makarand Lele, Former President, ICSI and SSB, ICMAI Member was the speaker.
- **49th Webinar:** The 49th Webinar of the Vasudhaiva Kutumbakam series was held on 16th January 2026 from 4 pm to 5:15 pm on the topic "Sustainable Takeaways from Thirukural". Mr. Ashok Ramasamy, Senior Manager, Muthoot Fincorp. Limited was the speaker.

b. Monthly Newsletter – Sukhinobhavantu

The Sustainability Standards Board released January 2026 edition of the monthly newsletter Sukhinobhavantu, which can be downloaded from the following link:

https://icmai.in/upload/Institute/Updates/SSB_Jan_2026.pdf

c. Certificate Course on ESG

The 6th batch admission for the Certificate Course on ESG has started. The link for the admission is as follows: **https://eicmai.in/OCMAC/SSB/SSB.aspx**

TAX RESEARCH DEPARTMENT (TRD)

The TRD sustained its progressive momentum throughout January 2026, further reinforcing its commitment to academic excellence, professional capacity building, and proactive stakeholder engagement within the taxation landscape.

In January 2026, the Department organized a series of high-impact webinars addressing contemporary and emerging issues under the Income Tax Act, 2025 and the GST framework. Led by eminent faculty and seasoned practitioners, these sessions provided invaluable insights into statutory interpretation, compliance governance, and the evolving nature of tax administration.

Direct Tax Series:

1. Webinar on 6th January 2026 on Re-Engineering Withholding Tax: A Modern Outlook on TDS & TCS Provisions under the ITA, 2025, by CMA Nitta Ravi Kishore
2. Webinar on 13th January 2026 on Strengthening Compliance Governance: Evolving Administration & Special Provisions for Charitable Trusts, by CMA Ajith Sivadas
3. Webinar on 20th January 2026 on India's International Tax Landscape: A Comparative Study of the 1961 Act vs. the 2025 Act, by CMA Mrityunjay Acharjee
4. Webinar on 27th January 2026 on Contemporary Analysis: Salary, House Property, & Deemed

Income under the ITA, 2025, by CMA Divya Abhishek

Indirect Tax – "कर क्रान्ति" Series:

1. Specialized session on 14th January 2026 titled "Intricacies of Input Tax Credit under GST" by CMA Niranjan Swain

Academic Outreach and Institutional Engagement

As part of the academic outreach, the TRD continued to foster strong ties with educational institutions

1. **Chevalier T. Thomas Elizabeth College**: GST courses were successfully conducted for an enrolment of 65 students.
2. **Dwaraka Doss Goverdhan Doss Vaishnav College**: The GST course examination for 80 students was successfully concluded on 19th January 2026

Publications and Professional Development

A significant milestone was achieved during the 63rd NCMAC 2026 wherein TRD released 12 comprehensive volumes covering critical areas of Direct and Indirect Taxation. These publications serve as a testament to the Institute's focus on creating practice-oriented reference material for our members and students.

BANKING, FINANCIAL SERVICES AND INSURANCE BOARD (BFSI BOARD)

BFSI Board has formally released 3 Comprehensive Publications named, The Guidance Note on Cost Control Strategies in the Banking Sector, Handbook on Central Bank Digital Currency (CBDC), Monograph on Climate Risk and Green Finance at the 63rd NCMAC 2026 on 11th January 2026.

ICMAI REGISTERED VALUERS ORGANIZATION (RVO)

ICMAI RVO has organised three "50-Hour Training Program" for securities or financial, Land & Building and Plant & Machinery asset classes. The RVO also organised nine online Professional Development Programs and two Physical Professional Development Programs at Kolkata and Nagpur in January 2026. In its efforts to bring out relevant publications for the development of the valuation profession, the company also released its monthly journal, The Valuation Professional.

ICMAI SOCIAL AUDITORS ORGANISATION (SAO)

ICMAI SAO has organised four online Professional Development Programs and one Physical Awareness Program on Social Stock Exchange on 21st January 2026 at Chhatrapati Sambhaji Nagar. The Company also released its monthly journal, The Social Impact Assessor.

INSOLVENCY PROFESSIONAL AGENCY OF THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (IPA-ICMAI)

IPA in its effort to promote professional development and enhance the skills of its members, has undertaken the following actions in the month of January 2026.

1. An Executive Development Program (EDP) titled "Liquidation under IBC: Evolving Strategies, Compliance & Beyond" was held on 2nd January 2026, focusing on the liquidation framework under the Insolvency and Bankruptcy Code
2. A Workshop on Professional Ethics, Liability and Disciplinary Processes under IBBI Oversight was held on 9th January 2026, focusing on the ethical responsibilities of Insolvency Professionals.
3. IPA-ICMAI, in collaboration with IIIPI and ICSI IIP, conducted the 69th Batch of the Pre-Registration Educational Course (PREC) virtually from 15th to 21st January 2026, offering aspiring Insolvency Professionals comprehensive training on the legal, procedural, and practical aspects of insolvency practice.
4. A Workshop on Sector-Specific Insolvency Challenges was held on 16th January 2026, providing insights into industry-specific issues, sectoral nuances, and tailored resolution strategies under the IBC framework.
5. IPA-ICMAI on 23rd January 2026 hosted a seminar on IBC in collaboration with KIPF & IBBI in person, discussing current developments under the IBC and enhancing stakeholder engagement within the insolvency ecosystem.
6. A Workshop on Committee of Creditors (CoC) Dynamics was held on 23rd January 2026, focusing on decision-making processes, voting mechanisms, fiduciary responsibilities, and practical challenges faced by CoC members during CIRP.
7. A workshop on "Liquidation – Beyond the Last Resort" was held on 30th January 2026, focusing on strategic considerations, value maximization strategies, compliance requirements, and emerging viewpoints on liquidation under the Insolvency and Bankruptcy Code.

Chairman's Communiqué

CMA Chittaranjan Chattopadhyay
Chairman, Agriculture Cost Management Board (ACMB)
The Institute of Cost Accountants of India

Dear Readers,

As we step further into 2026, it reminded that the story of India has always been written in its soil. We are no longer just *feeding a nation;* we are engineering a global powerhouse.

The transition we are witnessing this year is monumental, moving from *welfare-driven support to growth-led i*nvestment. The fields of 2026 look different than they did even five years ago. *"Kisan Drones"* now patrol the skies, and AI-driven precision farming dictates the exact drop of water or gram of fertilizer required. As *"Efficiency Auditors,"* our role is to ensure that every rupee spent on innovation translates directly into sustainable yields. We are the bridge between a farmer's hard work and a profitable harvest.

To reach the vision of Viksit Bharat 2047, our farm sector must be cost-competitive and self-reliant. To consider and highlight the contribution of Cost and Management Accountants in the Nation Building was the main reason behind writing the book *"***Role of CMAs in Viksit Bharat 2047"** by the Agriculture Cost Management Board (ACMB) of ICMAI. This book was released by His Excellency Governor of West Bengal, Dr. C.V. Ananda Bose on 17th October 2025 at Governor House.

ACMB have **signed a MoU** on 16th January, 2026 with Dr. C V Raman University, Khandwa, M.P. The collaboration will enable academia to engage with the real time sectoral challenges and help to translate cost management theory into practical strategies that can influence agri-policy and farm-level decision making.

ACMB is conducting a deep rooted research on TOP (Tomato, Onion & Potato) for the suggestive fixation of their price, this will support government to determine their price based on actual cost and other important factors which will open a different door in the agricultural sector for making *Atmanirbhar Bharat.*

ICMAI and IGNOU is running Diploma in Agri Cost Management (DACM) Course. This Open and Distance Learning (ODL) programme aims to educate and train individuals in the field of agricultural cost management. The farming community is being sensitized on two aspects for the purpose namely cost management and return maximization.

ACMB is regularly publishing journals and other publications like; Agri Cost Clinic, Research Monograph, Agri Bulletin (tri monthly journal); for the purpose of sharing knowledge & updating the farmers, and other stakeholders. **Guidance Note on Farmer Producer Organization (FPO)** was prepared and published in January, 2026 to aware that FPO can succeed from soil to multi crore investment.

ACMB is regularly conducting webinars, seminar and web discussions on various issues on agriculture by engaging eminent personalities. Of late, a joint seminar on agriculture was held with the ICMAI Indore Chapter on **"Role of CMAs in FPO and Viksit Bharat 2047".**

Nationwide Farmers' Day is celebrated on 23rd December. Like every year, ACMB has celebrated Farmers' Day on 23rd December 2025. To mark the celebration, a special webinar on **"Transforming Agriculture for Viksit Bharat 2047: Leveraging Cost Management"** was conducted on line which was graced by Dr. Vinayak S. Deshpande, Vice-Chancellor, G H Raisoni University, Amravati, as the Chief Guest, while the address of Guest of Honour was delivered by Dr. Arun R. Joshi, Vice-Chancellor, Dr. C.V. Raman University, Khandwa, M.P. Many other eminent speakers also graced the occasion.

I urge every member to engage with our upcoming webinars, to contribute insights to our research oriented publications. Let us combine our collective intelligence to ensure that the CMA remains the architect of agricultural prosperity.

Let us grow, not just crops, but a more resilient India.

Warm regards,

CMA Chittaranjan Chattopadhyay
1st February 2026

77th Republic Day Celebrations

by the **Institute of Cost Accountants of India**

on January 26, 2026

Report of
63rd National Cost and Management Accountants' Convention (NCMAC) 2026
RISE India - Reposition Intensify Strengthen Enhance
9th to 11th January, 2026
MERLIS Hotel, Coimbatore, Tamil Nadu

The Institute of Cost Accountants of India (ICMAI) successfully organised its 63rd National Cost and Management Accountants' Convention (NCMAC) 2026 from 9th to 11th January 2026 at Coimbatore, Tamil Nadu. Convened under the theme "RISE India – Reposition India and CMAs, Intensify Growth, Strengthen Competence & Enhance Capabilities," the three-day national convention presented a forward-looking professional roadmap aimed at empowering Cost and Management Accountants (CMAs) to emerge as key enablers of India's economic transformation in pursuit of Viksit Bharat 2047.

Coimbatore, renowned as the Manchester of South India, proved to be an apt host city, embodying a legacy of industrial excellence, entrepreneurial spirit and innovation-driven growth that closely aligned with the convention's vision and objectives.

Shri C. P. Radhakrishnan, Hon'ble Vice President of India, conveyed a special message acknowledging ICMAI's pivotal role in strengthening cost competitiveness, financial discipline and governance across industry and government. He observed that, as the world's largest professional body of Cost and Management Accountants, ICMAI continues to play a vital nation-building role by fostering professional excellence and reinforcing the foundations of a resilient and globally competitive economy. Emphasising the significance of inclusive professional dialogue, he expressed confidence that NCMAC 2026 would stimulate meaningful deliberations and actionable outcomes aligned with India's journey towards Viksit Bharat @ 2047.

The convention featured impactful inaugural and plenary sessions, followed by in-depth technical deliberations focusing on repositioning India and the CMA profession, accelerating professional growth, strengthening competence & capability and enhancing leadership across manufacturing & service sectors. Key discussions centred on Industry 5.0, ESG-led business transformation, digital finance ecosystems, AI-enabled cost management, innovation leadership and sustainability. The event witnessed over 1,000 participants including senior corporate leaders, policymakers, regulators, public sector executives and international professionals.

Healthcare emerged as a key area of national importance during the convention. ICMAI released its landmark publication, "Technical Guide on Cost Management in the Healthcare Services," developed by the Cost Accounting Standards Board (CASB),

offering a structured framework for effective cost optimisation and improved healthcare delivery. Further strengthening its thought leadership, ICMAI also released 12 publications by its Tax Research Department, along with additional publications by the BFSI Board and the MSME & Start-up Promotion Board.

The convention was inaugurated by the Chief Guest, Shri Narayan Sethuramon, Managing Director, Sanmar Engineering Technologies Ltd., and Chairman, CII International & Trade Policy Councils. In his address, he underscored the critical importance of Total Cost Management (TCM) in positioning India as a global hub for innovation and manufacturing, highlighting the strategic role of CMAs in driving efficiency, competitiveness, and sustainable value creation across industries.

Addressing the delegates, CMA TCA Srinivasa Prasad, President, ICMAI and Chief Patron, NCMAC 2026, stated that as India accelerates towards Viksit Bharat 2047, CMAs must rise as strategic leaders in nation-building. He outlined ICMAI's vision to strengthen professional capabilities, expand its global footprint and build capacity for advanced manufacturing & service-sector leadership. With over six lakh students and one lakh Cost Accountants, ICMAI aims to significantly expand the CMA workforce to meet the demands of a USD 30 trillion Indian economy, reaffirming the belief that behind every successful business decision, there is a CMA.

Further reinforcing this vision, CMA Neeraj D. Joshi, Vice President, ICMAI and Chairman, NCMAC 2026, described the convention as a defining milestone for the profession. He noted that as India embraces artificial intelligence, sustainability frameworks, digital governance, and advanced manufacturing, CMAs will assume increasingly strategic roles. Drawing parallels with Coimbatore's industrial dynamism, he emphasised that NCMAC 2026 was not merely an event, but a collective call to action for CMAs to actively contribute to India's economic future and the realisation of Viksit Bharat 2047.

The convention also highlighted the expanding role of CMAs in policy formulation, economic acceleration, and enhancing India's global competitiveness. Deliberations emphasised the integration of sustainability into core business strategies, promotion of resource-efficient production, advancement of ESG adoption, and alignment with global best practices as India progresses towards its Net Zero 2070 commitment.

The Valedictory Session was graced by Dr. E. Balagurusamy, Chairman, EBG Foundation and a renowned scholar, as Chief Guest. In his address, he reiterated his strong belief in skill-based education led by competent educators, while emphasising the importance of ethical and value-based learning.

The event was addressed by several distinguished dignitaries, including CMA Manoj Kumar Anand (Council Member & Convener), CMA Vijay Kiran Agastya (SIRC Chairman & Co-Chairman), CMA (Dr.) R. Maheswaran (Chairman, Coimbatore Chapter & Co-Convener); Guests of Honour CMA Pawan Kumar, Chief Adviser (Cost), Ministry of Finance; CMA Anand K. Pal, Principal Adviser (Cost), Ministry of Defence; and Eminent Speakers like CMA Sipan Kumar Garg, CMA Pankaj Malhotra, CMA AK Tiwari, CMA Rajesh Kumar Dwivedi, Shri Nagesh Babu, CMA Soma Dilip Ghosh, CMA Gagan Bihari Swain, CMA Rameesh Kailasam, CMA Robin Banerjee, CMA Gopala Ramanan, CMA N Ramanathan, CMA Asim Kumar Mukhopadhyay, CMA R Narayanan, CMA Harpreet Singh, CMA K Venkataramanan, CMA (Dr.) PA Padmanabhan, CMA Shilpa Shashank Joshi, CMA M. Hariharan, CMA P Thiruvengadam, Shri K Ilango, Prof. Vishwanath Pingali and Prof. Amit Karna along with other senior leaders and members from across the country.

In conclusion, the collective insights of the eminent speakers and delegates underscored that the way forward for the CMA fraternity and the Institute lies in adopting Total Cost Management as a national productivity framework, advancing ESG and green finance initiatives for sustainable value creation, building digital advisory ecosystems for MSMEs and industry, strengthening policy advocacy and fiscal reforms, and fostering ethical leadership, informed risk-taking, and sound professional judgment in the era of Industry 5.0. Above all, the convention reaffirmed the need to strengthen the CMA brand as India's trusted voice in governance, growth and national development, driving the vision of RISE India.

Glimpses

Day - 1 (January 9, 2026): Inaugural Session

Day - 1 (January 9, 2026): Plenary Session

Day - 2 (January 10, 2026): Technical Session – I

Day - 2 (January 10, 2026): Technical Session – II

Day - 2 (January 10, 2026): Technical Session – III

Day - 2 (January 10, 2026): CMA Leaders Meet

Day - 3 (January 11, 2026): Technical Session – IV

Day - 3 (January 11, 2026): Valedictory Session

CMA TCA Srinivasa Prasad, President, ICMAI attended the Award Ceremony and Professional Development Seminar organised by the ICMAI Bhiwani Chapter on 17th January 2026 in Bhiwani, Haryana. The event was graced by Prof. (Dr.) Pawan Kumar, Chairman, Board of School Education Haryana as Chief Guest, and Dr. Shiv Shankar Bhardwaj, Former MLA as Guest of Honour, along with CMA MK Anand, Council Member, ICMAI

CMA TCA Srinivasa Prasad, President, ICMAI, graced the Seminar of CMA Members organised by Udaipur Chapter of ICMAI in association with ICMAI NIRC as Chief Guest on 18th January 2026 (Sunday) at Udaipur, along with CMA Navneet Kumar Jain & CMA Rajendra Singh Bhati, Council Members, ICMAI

The Institute hosted IFAC President - Mr. Jean Bouquot; IFAC CEO- Mr. Lee White; CAPA CEO - Ms. Jennifer Lopez; SAFA Vice President- Mr. Prabin Kumar Jha and many other international delegates from the SAFA Region for a lunch meet on January 31, 2026

CMA TCA Srinivasa Prasad, President, ICMAI felicitating Mr. Lee White, CEO, IFAC at the Sustainability Summit 2.0 held at Noida on 29th January, 2026

Release of publication titled ICMAI Sustainability Standards 1 and 2 along with the Guidance Notes

CMA Neeraj D.Joshi, Vice President, ICMAI felicitating Mr. Lakshman R. Watawala, President CMA Srilanka and Past President, SAFA

CMA (Dr.) Ashish P.Thatte, Chairman, SSB, ICMAI felicitating Ms.Jennifer Lopez, Chief Executive CAPA

Glimpses of "Rise India: Leadership Summit 2026", Pune, 30th January 2026

RISE India-Leadership Summit 2026, Pune: Strategic Leadership in GCCs-CMAs as Architects of Value Creation: Vice President-CMA Neeraj D Joshi, Former President - CMA B B Nayak, Council Member - CMA Vinayaranjan P, WIRC Secretary - CMA Chaitanya L Mohrir, Pune Chapter Chairman - CMA I Shrikanth Welcoming the Chief Guest Shri CMA RAJANEESH JAIN, President & CFO of Reliance Jio Infocomm Ltd.

Chief Guest Shri CMA RAJANEESH JAIN, President & CFO of Reliance Jio Infocomm Ltd. addressing the audience in the Inaugural session of the event.

Technical Session-2: RISE India: Leadership Summit 2026, Pune. Strategic Leadership in Global Capability Centers - CMAs as Architects of Value Creation.

Glimpses of Corporate Delegates at the event: RISE India: Leadership Summit 2026, Pune. Strategic Leadership in Global Capability Centers - CMAs as Architects of Value Creation.

Technical Session-1: RISE India: Leadership Summit 2026, Pune. Strategic Leadership in Global Capability Centers - CMAs as Architects of Value Creation.

Technical Session-3: RISE India: Leadership Summit 2026, Pune. Strategic Leadership in Global Capability Centers - CMAs as Architects of Value Creation.

Team CMA PUNE-GCC: RISE India: Leadership Summit 2026, Pune. Strategic Leadership in Global Capability Centers - CMAs as Architects of Value Creation.

UNION BUDGET 2026-27 ANALYSIS

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Highlights

- **Expenditure:** The government expects total spending in 2026–27 to be ₹53,47,315 crore, which is 7.7% higher than the revised estimate for 2025–26. Interest payments form a significant portion—about 26% of total expenditure and roughly 40% of revenue receipts.
- **Receipts:** Total receipts excluding borrowings are projected at ₹36,51,547 crore in 2026–27, around 7.2% above the revised level of 2025–26. Tax revenue, the largest component of receipts, is expected to grow by about 8% compared to the revised estimate for 2025–26.
- **GDP:** For 2026–27, the government has assumed 10% nominal GDP growth, reflecting the combined effect of real economic growth and inflation.
- **Deficits:** The revenue deficit for 2026–27 is set at 1.5% of GDP, the same as the revised estimate for 2025–26. The fiscal deficit is targeted at 4.3% of GDP, slightly lower than the revised 4.4% of GDP in 2025–26.
- **Debt:** The central government plans to bring its outstanding liabilities down to about 50% of GDP by March 2031. In 2026–27, outstanding liabilities are estimated at 55.6% of GDP.

Provisions for Professional Institutions

Government will facilitate professional institutions (ICAI, ICSI, ICMAI) to design short-term modular courses and practical tools to create a cadre of "Corporate Mitras" (accredited para-professionals) to help MSMEs meet compliance needs affordably—especially in Tier-II/III towns.

This is a big opening for:

- compliance toolkits/templates,
- MSME bookkeeping + GST/TDS/TCS processes,
- basic corporate law/ROC support,
- cost/working-capital advisory and bank documentation.

Main Tax Proposals in the Finance Bill

- **No change in income-tax slabs:** The income-tax slab structure for AY 2026–27 remains the same as in the previous year.
- **Tax holidays:** A tax holiday up to 2047 has been offered to foreign firms providing global cloud services through Indian data centres, as long as services to Indian customers are delivered via an Indian reseller. In addition, the tax holiday for units in the International Financial Services Centre (IFSC) and Offshore Banking Units has been extended from 10 years to 20 years. After the holiday period, IFSC unit income will be taxed at 15%.
- **Taxation of share buybacks:** Buybacks are proposed to be treated as capital gains for tax purposes, along with an extra buyback tax applicable to promoters. This results in an effective tax rate of 22% for corporate promoters and 30% for non-corporate promoters.
- **Higher Securities Transaction Tax (STT):** STT rates have been increased:
  - **Options:** from 0.10% to 0.15%
  - **Options exercised:** from 0.125% to 0.15%
  - **Futures:** from 0.02% to 0.05%
- **Deductions linked to mutual fund income:** Interest expenditure incurred to earn dividend income or income from mutual fund units will no longer be allowed as a deduction. Earlier, this deduction was permitted up to 20% of the gross dividend / mutual fund income.

- **Minimum Alternate Tax (MAT):** From April 1, 2026, no further accumulation of MAT credit will be permitted. The MAT rate is being lowered from 15% to 14%. Under the new tax regime, MAT credit set-off will be limited to 25% of the tax liability.
- **Foreign Assets disclosure scheme (2026):** A time-bound disclosure window has been introduced for certain small taxpayers (including returning non-residents) to report foreign assets. The scheme provides graded relief, including possible immunity from penalties and prosecution, provided the taxpayer pays applicable tax, an additional levy, or a fixed fee, depending on the nature of the non-disclosure.
- **Easier rules for non-residents:** Key relaxations include:
  1. A five-year income tax exemption for supplying capital goods to electronics manufacturers,
  2. Exemption from tax on global income for certain expert non-residents working in India for up to five years under notified schemes, and
  3. Extension of MAT exemption to more categories of non-residents.
- **Penalty and prosecution rationalisation:** Several offences have been decriminalised, and for others the maximum imprisonment has been capped at two years.
- **Tax Collected at Source (TCS):** TCS rates have been reduced:
  - For remittances above ₹10 lakh for education or medical treatment, TCS is cut from 5% to 2%.
  - For purchase of an overseas tour package (including travel and hotel expenses), TCS is reduced from 5% / 20% (depending on amount) to 2%.

Main proposals in Indirect Taxes:

Custom:

- Duty-free imports of specified inputs used for processing seafood products for export, from the current 1 per cent to 3 per cent of the FOB value of the previous year's export turnover.
- Duty-free imports of specified inputs, which is currently available for exports of leather or synthetic footwear, to exports of Shoe Uppers as well.
- Extension of the time period for export of final product from the existing 6 months to 1 year, for exporters of leather or textile garments, leather or synthetic footwear and other leather products.

Ease of Doing Business

- Approvals required for cargo clearance from various Government agencies will be seamlessly processed through a single and interconnected digital window by the end of the financial year.
- Processes involved in clearance of food, drugs, plant, animal & wild life products, accounting for around 70 percent of interdicted cargo, will be operationalised on this system by April 2026 itself.
- For goods not having any compliance requirement, clearance will be done by Customs immediately after online registration is completed by the importer, subject to the payment of duty.
- Customs Integrated System (CIS) will be rolled out in 2 years as a single, integrated and scalable platform for all the customs processes.
- Utilization of non-intrusive scanning with advanced imaging and AI technology for risk assessment will be expanded in a phased manner with the objective to scan every container across all the major ports.
- Complete removal of the current value cap of ₹10 lakh per consignment on courier exports. In addition, handling of rejected and returned consignments will be improved with effective use of technology for identifying such consignments

Central Excise Duty Changes:

Exemption of Central Excise Duty on value of Biogas/Compressed Biogas (CBG) contained in Blended Compressed Natural Gas (CNG) : The value of Biogas/Compressed Biogas (CBG) and the appropriate Central Tax, State Tax, Union Territory Tax or Integrated Tax, as the case may be, paid on such Biogas or CBG contained in blended CNG, is being excluded from the transaction value for the purpose of computation of central excise duty on such blended CNG

Amendment to Seventh Schedule to the Finance Act, 2001 to revise the National Calamity Contingent Duty (NCCD) Rate with effect from 01.05.2026 with no change in the effective duty rate***

S. No.	Description	NCCD Rate	
		From (per cent)	To (per cent)
1	Chewing tobacco	25%	60%
2	Jarda scented tobacco	25%	60%
3	Other	25%	60%

Note: Description of entries is indicative. Notification/ Tariff may be referred for complete description.

****effective duty rate will be maintained at 25% by notification*

Policy Highlights

- **Finance and the Economy:** The government plans to constitute a High-Level Committee on Banking for Viksit Bharat to undertake a comprehensive review of the banking sector. It will also re-examine the Foreign Exchange Management (Non-debt Instruments) Rules with the aim of making foreign investment regulations simpler and more user-friendly.

In addition, individual Persons Resident Outside India (PROI) will be allowed to invest in equity shares of listed Indian companies through the Portfolio Investment Scheme (PIS). Under this scheme, the permitted investment ceiling for an individual PROI will be raised from 5% to 10%.

To deepen corporate bond markets, proposals include a market-making framework (including access to funding and derivatives linked to corporate bond indices) and the introduction of total return swaps on corporate bonds. Further, to promote municipal bond issuance, an incentive of ₹100 crore has been announced for any single municipal bond issue exceeding ₹1,000 crore.

- **Industry and Commerce:** The government will roll out a programme to rejuvenate 200 traditional industrial clusters by upgrading technology and improving supporting infrastructure. A new integrated textile programme is planned with five components: (i) National Fibre Scheme, (ii) Textile Expansion and Employment Scheme, (iii) National Handloom and Handicraft Scheme, (iv) Tex-Eco Initiative, and (v) Samarth 2.0. To further promote khadi, handloom, and handicrafts, a Mahatma Gandhi Gram Swaraj initiative has been proposed. To help build "Champion SMEs," the following measures are planned: (i) an SME Growth Fund with an outlay of ₹10,000 crore, (ii) additional support to the Self-Reliant India Fund, and (iii) liquidity assistance.
- **Infrastructure:** Public capital expenditure is proposed to rise from ₹11.2 lakh crore to ₹12.2 lakh crore. An Infrastructure Risk Guarantee Fund will be created to boost confidence among private developers. In the Purvodaya states, five tourism sites will be developed and 4,000 electric buses will be deployed. A dedicated freight corridor is proposed to link Surat and Dankuni, while 20 new national waterways are planned to become operational over the next five years. New schemes will also support modern construction/infrastructure equipment and container manufacturing.
- **Urban Development: City Economic Regions (CERs)** will be identified and mapped based on their unique growth drivers, with funding of ₹5,000 crore per CER over five years. In addition, seven high-speed rail corridors are proposed between selected city pairs.
- **Labour and Employment:** A Standing Committee on "Education to Employment and Enterprise" will be established to strengthen the services sector and to examine how artificial intelligence may affect employment trends.
- **Education:** The plan includes setting up five university townships along key industrial and logistics corridors. Support will also be extended to the Indian Institute of Creative Technologies, Mumbai, to create animation, VFX, gaming, and comics content-creator labs in 15,000 secondary schools and 500 colleges.
- **Energy and Technology Manufacturing:** Funding for the Electronics Component Manufacturing Scheme will be increased from ₹22,919 crore to ₹40,000 crore. Dedicated Rare Earth Corridors will be developed in Odisha, Kerala, Andhra Pradesh, and Tamil Nadu. An allocation of ₹20,000 crore over five years has been proposed for carbon capture, utilisation, and storage (CCUS). Further, Semiconductor Mission 2.0 is set to be launched.
- **Health:** New institutions for allied health professionals will be set up in both the public and private sectors, covering areas such as radiology, anaesthesia, and behavioural health. To boost medical tourism, the government plans to develop five regional medical hubs. In addition, three All India Institutes of Ayurveda are proposed.
- **Pharmaceuticals:** To strengthen domestic manufacturing of biologics and biosimilars, the Biopharma SHAKTI scheme (Strategy for Healthcare Advancement through Knowledge, Technology, and Innovation) will be rolled out for five years with an allocation of ₹10,000 crore. The plan also includes setting up three National Institutes of Pharmaceutical Education and Research (NIPERs) and upgrading seven existing institutions.
- **Agriculture:** Tax deductions will be extended for cooperative members involved in supplying cotton seeds and cattle feed. The animal husbandry sector will receive support through a credit-linked subsidy programme. Further, a coconut development scheme will be implemented to raise overall production. MA

49th INTERNATIONAL KOLKATA BOOK FAIR 2026

The Institute participated in the 49th International Kolkata Book Fair 2026 through its Career Counselling & Placement Committee, held from 22nd January 2026 to 03rd February 2026 at Boimela Prangan, Salt Lake, Bidhannagar, Kolkata.

The ICMAI stall at the International Kolkata Book Fair served as a vibrant hub of intellectual exchange, attracting a diverse audience of students, scholars, and bibliophiles throughout the event.

As part of the Republic Day celebrations, the Career Counselling & Placement Committee of the Institute organised cultural programmes featuring eminent playback singers Shri Rupankar Bagchi and Ms. Chandrika Bhattacharya. CMA TCA Srinivasa Prasad, President, ICMAI, addressed the gathering during the Republic Day Celebrations at the Book Fair. CMA Vinayaranjan P, Council Member & Chairman, Career Counselling & Placement Committee, delivered the welcome address. The cultural programme was moderated by CMA Chittaranjan Chattopadhyay, Council Member, ICMAI. CMA Manas Kr. Thakur, CMA Biswarup Basu, Former Presidents, CMA Avijit Goswami, Council Member of the Institute and Tridib Kr. Chatterjee, Hony. General Secretary, Publishers & Booksellers Guild, International Kolkata Book Fair also graced the occasion.

In addition, the Quiz Competition organised by the Institute drew significant attention and witnessed enthusiastic participation from a large number of visitors at the Kolkata Book Fair. CMA TCA Srinivasa Prasad, President, ICMAI; CMA Chittaranjan Chattopadhyay, CMA Avijit Goswami, and CMA Vinayaranjan P, Council Members of the Institute; CMA Arati Ganguly, Chairperson, ICMAI-EIRC; and CMA Abhijit Dutta, Secretary, ICMAI-EIRC, visited the ICMAI Stall at the Book Fair and handed over prizes to the winners of the Quiz Competition.

ISSUES AND CHALLENGES FACED BY FARMERS IN SUSTAINABLE AGRICULTURE

Abstract

Agriculture significantly contributes to Indian economy; however, it faces numerous issues and challenges. The study examines select issues and challenges faced by small farmers, cultivating commercial crops in 6 districts of Tamil Nadu, India. The issues and challenges identified in the study are lack of knowledge on cost accounting, sunk cost, price fluctuation, price determination, return on investment and standard of living. The study shows that majority of the farmers (around 73 per cent) have a low level of awareness on ascertainment of cost of production. It also reveals that there is no significant association between district in which the farmers cultivate and level of awareness on ascertainment of cost of production. The study also reveals that agricultural sustainability requires addressing these challenges in a systematic and inclusive manner. The study suggests that role of Cost Accountants is crucial in addressing these issues.

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Introduction

Agriculture plays a crucial role in India's economy, contributing significantly to food security and rural employment. India is the world's second largest in agricultural land area and is a leading agricultural producer (*IBEF*, n.d.). However, agriculture in India faces numerous issues and challenges. In this context, sustainability of agriculture remains questionable as economic viability and stable income for farmers is a serious concern. This study examines the major issues and challenges faced by the farmers to ensure sustainability of agriculture.

Methodology

Small farmers, cultivating commercial crops constitute the population of the study. Non-probability convenient sampling method was used to collect the primary data from a sample size of 384, using interview schedule along with observation. The secondary data were collected from books, journals, government reports and websites. The study was undertaken in 6 districts (64 samples each), namely, Coimbatore, Cuddalore, Dindigul, Krishnagiri, Thiruvannamalai and Tirunelveli of Tamil Nadu, India in 2025.

Analysis and Discussion

I Socio-economic profile of the respondents

Majority of the respondents (92 per cent) are men and only 8 per cent are women. Around 70 per cent of the farmers are school educated. The average family size is around 4.20. Around 80 per cent of the farmers live in their own houses. Around 78 per cent of respondents live in pucca houses. The average annual farm income is Rs.1,95,000. For half of the respondents, farm income contributes upto 48 per cent of the total household income. The average annual household expenditure is around Rs.2,32,000. For half of the respondents, farm income contributes more than 54 per cent of the total household expenditure.

II Challenges of farmers engaged in agriculture in India

The farmers chosen in the study face several challenges. The following challenges are analysed in this study.

i) Lack of knowledge on Cost Accounting

Economic value is a key factor for sustainability of any sector. Sustainability in farming greatly depends on its earnings. The true earnings can be known only when accounting is properly done with regard to cost of production. Cost of production includes both cash cost and non-cash cost. Cash costs are the costs for which a farmer spends money for acquisition of material inputs or labour inputs. Non-cash costs are attributable to items of cost, which do not require spending money like family labour, household made manure (own), exchange labour and depreciation.

As per Indian Cost Accounting Standards 6 (CAS-6) on Material Cost, the material cost may include imputed costs. In farming, the value of own materials (farm yard manure and fertiliser) used by the farmers can be imputed. The non-cash cost can be valued on the basis of the normal market value.

As per Indian Cost Accounting Standard 7 (CAS-7) on Employee Cost, principles of measurement state that employee cost shall not include imputed costs. It also states that any change in the cost accounting principles and methods applied for the measurement and assignment of the Employee Cost during the period covered by the cost statement which has a material effect on the Employee Cost must be disclosed. But, as per "Concept note on augmenting the farmers' income: Road map for CMAs", the cost estimates must take into account real factors of production and include all actual expenses in cash and kind incurred by the farmer for the production, rent paid for leased land, imputed value of family labour, interest value of owned capital assets (excluding land), rental value of owned land (net of land revenue), depreciation of farm implements and buildings and other miscellaneous expenses.

In farming, the imputed cost of labour can be included in the Direct Labour Cost for better understanding and reporting.

As per the Report of the Expert Committee to examine methodological issues in fixing MSP, Government of India, the value of family labour must be imputed by considering the statutory wage rate or actual market rate whichever is higher. On this basis, the value of family labour (farmer and family members), can be imputed.

While apportioning overhead cost such as irrigation cost, electricity, motor's repair and depreciation, borewell's repair and depreciation or transportation cost, appropriate bases are to be used. Activity based costing is the best technique to apportion the overheads based on the activities involved in the farming. While apportioning depreciation, weightage is to be given for the cultivation area. Preliminary expenses in farming refers to cost incurred in initial years before the first yield, which are to be amortised over the useful life of the crop.

The study shows that the respondents face difficulty in accurately determining the costs of their agricultural products due to lack of understanding of these cost accounting principles and standards. Most farmers do not maintain systematic cost records and therefore remain unaware of the actual cost of production. Costing concepts such as cost units, consideration of imputed cost, amortisation of establishment cost and allocation of overheads are largely absent at the farm level. Consequently, they are unable to determine break-even point,

contribution, or assess whether they are earning true profit or loss. The study shows that majority of the farmers (around 73 per cent) have a low level of awareness on ascertainment of cost of production.

To know the association between district in which the farmers cultivate and level of awareness on ascertainment of cost of production, Chi-Square test was used. The analysis shows $\chi^2 = 5.439$, df = 10, N = 384, $p>0.05$ ($p = 0.860$). Since the p value is not less than 0.05, there is no significant association between district in which the farmers cultivate and level of awareness on ascertainment of cost of production.

The absence of standardised costing and compliance with cost accounting principles and standards weakens pricing decisions, restricts financial planning and leads to persistent income instability among the farmers, thereby posing a serious challenge to the sustainability of agriculture in India.

Farmers should be regularly trained on basic cost accounting principles and standards through organisations like Krishi Vigyan Kendras (KVK), Farmer Producer Organisations (FPO) and The Institute of Cost Accountants of India (ICMAI). ICMAI should undertake more research, publish guidelines and offer advisory services on agricultural costing to support agricultural sustainability by standardising farm cost concepts.

ii) Sunk cost

Sunk costs are the historical costs which are incurred in the past and are not relevant for decision making for the current period. These are the costs incurred on a project and cannot be recovered if the project is terminated. Sunk cost in agriculture shall include cost incurred for drilling borewell which do not yield water, money spent on crop for purchase of seeds, fertilisers, pesticides, labour or overheads which was lost in drought or on failed crop. Sunk costs are classified as non-relevant costs for decision making. It is not included in the cost of production. Sunk cost poses a significant challenge to agriculture in India, as farmers incur substantial sunk cost which reduces the overall profitability and weaken the Return on investment and results in investment distortions as they are irrecoverable. Repeated sunk cost threatens the sustainability of farming operations and farmers. In this study, majority of the respondents (around 60 per cent) have incurred sunk cost in one way or the other. Farmers should be encouraged to take insurance for crop to reduce the incidence of sunk costs arising from crop failure. They should conduct basic feasibility and cost benefit analysis before making capital investment to avoid creation of sunk cost.

iii) Price Fluctuation

Price fluctuation refers to the substantial and unpredictable movement in market prices and it plays a key role in agriculture. A study using 23 commodities across 165 Indian markets (2010–2024) confirms that agricultural price volatility is a significant and critical issue (Manogna et al., 2025). Price fluctuation poses a serious challenge to farmers as their income is directly dependent on the price, they obtain by selling their crop in the market. In season when supply increases, prices often crash sharply, resulting in low selling prices, in some cases even below the actual cost of production. In some cases, produce remains unharvested as farmers are unable to meet the harvesting and transportation costs. Conversely, during off-season, prices may surge but farmers often do not reap its benefit, as they are unable to store the produce which are produced in season due to poor warehousing and the perishable nature of produce and moreover, the production is low in off-season. The government should take measures for price stabilisation and market intervention schemes to protect farmers from sharp price crashes.

iv) Price Determination

In India, where the price of many commodities is decided by the producers, the price of agricultural produce is usually determined through a combination of market forces and government intervention. The demand and supply factors largely influence the prices of agricultural produce, while Minimum Support Price (MSP) is announced by the government to protect farmers from price crashes. MSP is a mechanism through which the government

supports farmers by purchasing their crops at a pre-determined price. The aim of MSP is to protect farmers from distress sales and price volatility (*PIB Headquarters*, n.d.).

A comparison of Domestic Market Prices and MSP provided in Commission for Agricultural Costs and Prices (CACP) in its report for the Kharif season 2025, prices of crops like tur/arhar, urad, groundnut, soybean, moong and cotton were significantly below the MSP (Commission for Agricultural Costs and Prices, 2025). Despite the existence of the MSP regime, a large proportion of farmers do not get its benefits as they sell their produce to private traders at prevailing market prices.

Further, MSP is provided only for 22 mandated agricultural crops, while many crops are not covered under MSP. This excludes a large proportion of small and marginal farmers from the benefit of MSP. MSP benefits should be extended to all crops and measures should be taken to ensure assured procurement on a timely basis.

v) Return on Investment (ROI)

Return on Investment (ROI) is the earning or profit generated on the amount of money invested. In agriculture it is calculated by dividing the net return from agriculture by cost of investment. Net return is the total amount of money from agriculture less all the cost incurred. The expected profit should be computed by adding the risk premium with the risk-free rate of return. Risk refers to the variability in the expected return of an investment. It arises from factors such as changes in demand, opportunity cost, fluctuations in product prices and raw material costs, pest infestations, labour shortages, water scarcity and natural calamities.

Risk free rate of return is the return earned on investment without taking any risk, for example, return on long term bank deposits, government bonds and treasury bills. Risk premium is the expected additional return to be added for the risk taken. The analysis of the data from CACP for the year 2023-2024 show that the profit margins for most crops have declined (Thakur, 2025). Many farmers in India often invest large amounts in agricultural inputs but their income is low and unstable. Their returns relative to what they put in are often less compared with other businesses like manufacturing or service sectors. Many farmers struggle to earn enough after costs, and rising input costs often surpass price gains. Youth are not encouraged from entering into farming due to unattractive return on investment from agriculture.

vi) Standard of living

There are several factors that influence the standard of living of the people. One of the important factors is the annual household income. A report by India today based on a survey by NABARD shows that the average monthly income of an Indian farming household is only Rs.13,661, of which just Rs.4,476 (33 per cent) comes from agriculture. In this study, the annual household income of the respondents varies between Rs.29,785 and Rs.8,05,624; the mean is around Rs.3,12,000 and the median is around Rs.2,95,000. The Global Living Wage Coalition (GLWC) defines Living income as the net annual income required for a household in a particular place to afford a decent standard of living for all members of that household (Global Living Wage Coalition, 2019). As per the GLWC, the living income for Rural Nilgiris, Tamil Nadu, India (updated for 2025) is Rs.2,90,256. The study shows that around 46 per cent of the respondents' household income is below the living income benchmark for Nilgiris. The study also shows that around 90 per cent of the respondents do not save.

Conclusion

This study highlights the major issues and challenges of the farmers that constrains the long-term viability of the agricultural sector. Majority of the respondents have low level of awareness on ascertainment of cost of production. In this study, majority of the respondents (around 60 per cent) have incurred sunk cost in one way or the other. The study shows that around 46 per cent of the respondents' household income is below the living income benchmark for Nilgiris. Agricultural sustainability requires addressing these challenges in a systematic and inclusive manner with policy

interventions to secure the long-term sustainability of the agricultural sector. The role of Government and Cost Accountants is crucial in addressing these issues, as effective cost accounting is essential for informed decision making and economic sustainability of agriculture. MA

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COST OPTIMIZATION IN FARM OPERATIONS

Abstract

The farm sector is considered to be a cornerstone of the economy in several countries. It not only contributes to a country's gross domestic product (GDP) but also generates employment. The farm sector helps a country attain food security while giving it opportunities to improve trade balance through higher exports. Higher exports also help bring foreign exchange into the country. Output from the farm sector becomes input for other sectors and helps in the smooth running of those sectors. When done in a sustainable manner, farming can help in reducing emissions and conserve resources. A key aspect that can help a country's farm sector to prosper and function smoothly is optimization of costs. In this backdrop, the current article attempts to explain why cost optimization matters in the farm sector and how it can be accomplished.

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COST OPTIMIZATION AND ITS RELEVANCE IN FARMING

Cost optimization is not just cost cutting. It goes beyond the traditionally understood meaning of cost cutting. In cost optimization, the aim is to reduce avoidable or unnecessary expenses while enhancing efficiency or at least maintaining the existing levels of efficiency. Efficiency differs from effectiveness. Effectiveness focuses on a result (i.e., whether a particular level of effort or resources can give the intended outcome or not) whereas efficiency focuses on accomplishing the same result or outcome (or even better) through lesser effort or lesser resources.

In farming, cost optimization is relevant because it helps in several ways as listed below.

1. **Protection of profit margins**: Market prices often fluctuate and so do input costs, thereby causing profit margins to be lower than expected. Cost optimization helps with not just keeping costs in control but also ensuring that there is no negative impact on efficiency.
2. **Efficiency in operations**: There is a clear linkage between streamlined operations, reduced wastage, better utilization of resources and greater productivity. This is made possible due to cost optimization efforts.
3. **Mitigation of financial risks**: Cost optimization helps to accomplish relatively predictable and stronger financial outcomes. This prepares the farm sector to deal with uncertainties such as weather events and market fluctuations in a much better manner.
4. **Encouraging sustainable practices**: In the pursuit of cost optimization efforts, farms adopt sustainable practices which helps them make much better use of available resources and reduce the negative impact of farming practices on the environment. This also helps accomplish social and environmental responsibilities.

ACCOMPLISHING COST OPTIMIZATION IN FARM OPERATIONS

There are several ways in which cost optimization can be accomplished in farm operations. These ways are listed below but are not specific to any one country. Depending on the unique circumstances prevailing in any specific country, these ways of accomplishing cost optimization may have varying degrees of importance.

1) Optimization of farm machinery and equipment

Some of the ways in which this can be accomplished are discussed below.

- ***Lease versus buy decisions***: Significant increase in repairs and maintenance costs, inability to complete field work, or lack of enough farm equipment can be reasons that trigger a lease versus buy decision. While the availability of tax deductions and the resultant reduction in income tax liability can be a good reason to buy farm machinery and equipment instead of leasing the same, it should be kept in mind that the choice between leasing and buying may not change much in terms of the overall deductions that can be claimed. It may just cause a difference in the timing of deductions and interest costs. This will depend on the prevailing tax laws. Besides tax considerations, it is important to take into consideration the all-in costs associated with leasing and buying. The costs of borrowing may appear the same in both leasing and buying if the rates for leasing and financing are the same but there will be differences in all-in costs due to application fees, registration fees, and other fees. Thus, taking well-informed lease versus buy decisions can help with avoiding unnecessary costs tied to farm machinery and equipment.
- ***Shared machinery and equipment***: Is there is a possibility of sharing machinery and equipment with nearby farms and nothing in the law prohibits it, farms can explore this as an option rather than leasing or buying the machinery and equipment. There is earning potential when one farm lets another farm use its machinery and equipment for a fee. For the farm that is using the machinery and equipment, this fee will translate into a much lower strain on cash resources when compared to a lease or a buy decision.
- ***Scheduled maintenance and servicing***: Farm machinery and equipment should be subjected to regular maintenance and servicing so that the lifespan of these assets can be extended, sudden expensive repairs can be avoided and performance can be kept at optimum levels.

2) Optimization of workforce

Some of the ways of optimizing workforce in farming are discussed below.

- ***Technology adoption***: A lot of manual labour is required in various activities such as seeding, weeding, harvesting, mapping etc. More human effort can lead to more human errors and wastage that could have been avoided in the first place. Robotic systems, while requiring initial investment, can help reduce costs in several ways by reducing dependency on human labour and enhancing precision. For instance, mechanical weeders can be used on an organic farm to plough under weeds or to remove weeds. Robotic harvesters can handle delicate crops with least damage. Seeding and mapping can be performed much efficiently using drones. Thus, the adoption of technology can help free up labour so that they can focus more on data analysis or other such activities in relation to their farms. Technology adoption, however, is not easy because there may be difficulties related to integration of different technologies with the existing farm workflows. There could also be issues of interoperability between different technologies. In some countries, there may be rising concerns of job losses due to the adoption of technology.
- ***Upskilling and training***: While technology adoption can take away certain activities from human labour, it cannot entirely replace manual labourers. Human labour can be trained so that they can help with successful integration of technologies on the farm, acquire different skills and get opportunities to advance their careers within the farm sector. Upskilling of workforce can lead to better decisions, better maintenance of technology and tools, and timely interventions by the workforce. This in turn can help with lower waste, reduced costs, better farm produce and greater efficiencies.
- ***Careful labour planning***: Seasonal and operational considerations should guide labour planning. By focusing on seasonal and operational requirements, farms can avoid overstaffing. This can help reduce costs while ensuring that there is no negative impact on farm productivity.

3) Optimization of inputs

Some of the ways to accomplish this are discussed below.

- ***Precision farming***: Precision farming posits that an entire field cannot be treated as homogenous because there will be differences moisture levels, nutrient needs and soil within the field. It is, therefore, important to identify these different field zones and adjust farm practices to avoid unnecessary costs and attain better productivity. For example, remote sensing and

GPS-guided equipment can be used to determine different field zones and apply only the required or appropriate quantity of fertilizers, pesticides and other inputs. This variable rate application helps to reduce unnecessary costs that would result from overapplication of inputs while ensuring that farm productivity does not suffer. There are various apps available that use machine learning to monitor infestations by pests and guide farm workers in effective pest management. Some apps come integrated with satellite technology and help farm workers to remotely monitor crop health, thereby reducing the time and costs incurred in making physical visits to the fields.

> Farms can optimize overall costs through optimizing costs of labour, inputs, farm machinery and equipment, and supply chain and logistics

- ***Crop choices***: Crops should be selected based on parameters such as being disease-resistant, optimum input-to-output ratios, suitability for local conditions, among others. This can help with avoiding the purchase of inputs that have no relevance to certain crop varieties which will not be chosen by the farmer.

4) Optimization of supply chain and logistics

Supply chain and logistics optimization can be accomplished in the following manner.

- ***Transportation considerations***: Farmers can use route optimization software to determine optimal paths based on fuel station availability, traffic conditions, road conditions, etc. Load efficiency can be improved by consolidating shipments. Robust relationships with logistics partners that provide backhaul opportunities can help in optimizing transportation costs.
- ***Storage solutions***: Until their harvest gets sold, farmers need to have reliable storage solutions. While metal bins may rust, wood bins may rot, plastic bins will neither rust nor rot. Besides, plastic bins can be tough and durable enough to withstand extreme weather while storing both dry and moist products. Warehouses are also suitable options for storage as they are equipped to keep the produce fresh for longer periods through temperature control. Cooperative storage facilities involve several farmers collaborating to use large storage units. This can help reduce the cost of storage for each individual farmer while increasing operational efficiency. Technology can also be leveraged to reduce electricity costs and manage inventories better. Solar-powered cooling systems maintain optimal temperatures and are less expensive than cooling systems that depend on electricity. Several apps specialize in inventory management and provide real-time data related to storage conditions and inventory levels while analyzing market trends to suggest optimal selling windows.
- ***Relationships with suppliers***: Robust relationships with suppliers help in negotiating favourable terms and lower prices. It becomes easier to ensure bulk supplies or enter into longer-term agreements when relationships with suppliers are strong. This in turn helps with optimizing costs and inputs for the farm.

CONCLUSION

Optimization of labour, inputs, farm machinery and equipment, and supply chain and logistics can help in reducing wasteful expenditures and enhancing efficiencies in farm operations. However, there are challenges that accompany the optimization journey in the short-term, such as initial cash outlays, technology integration issues, workforce changes, etc. If these challenges are overcome and the optimization journey is pursued, the benefits to farmers will manifest in several ways along the journey. MA

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SUSTAINABLE AGRICULTURE FOR A RESILIENT AND FOOD-SECURE INDIA: THE STRATEGIC ROLE OF CMAs

Abstract

Sustainable agriculture is central to building a resilient and food-secure India as the nation progresses toward its Vision 2047. With agriculture supporting over half of India's workforce and facing challenges such as soil degradation, water stress, climate variability, and rising input costs, transformational reforms are imperative. This article explores how key national initiatives the **National Mission for Natural Farming,** the **Digital Agriculture Mission,** and **Climate-Smart Agriculture** are reshaping India's agricultural ecosystem by promoting ecological balance, technology-driven decision-making, and climate resilience. It further highlights the importance of Activity-Based Costing in improving cost transparency, optimizing resource allocation, and making sustainable practices economically viable. The strategic role of Cost and Management Accountants is emphasized in designing costing models, evaluating sustainability investments, supporting digital agriculture, and guiding policy-level decisions. By integrating environmental stewardship, technological innovation, and robust financial management, India can enhance farmer's income , protect natural resources, and ensure long-term food security. Sustainable agriculture, backed by sound costing and governance, will be the cornerstone of India's resilient agricultural future.

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Introduction:

Agriculture lies at the heart of India's economic strength, ecological stability, and food security. With over 55% of India's workforce dependent directly or indirectly on agriculture (Source: Economic Survey of India 2023–24) and the sector contributing nearly 18% to the national GDP, (Source: Economic Survey of India 2023–24) the need for a sustainable, climate-resilient, and technologically empowered agricultural ecosystem has never been more critical. As the country marches toward its development vision for 2047, transforming its agricultural landscape is essential to ensuring food security for a projected population of 1.6 billion (Source: United Nations, World Population Prospects 2022) while safeguarding natural resources for future generations.

Sustainable agriculture is no longer an option but a necessity. Challenges such as soil degradation, groundwater depletion, rising input costs, climate vulnerability, and stagnating farmer incomes demand structural reforms and new approaches. India loses nearly 5.3 billion tonnes of soil annually, (Source: ICAR; Central Ground Water Board (CGWB), Ministry of Jal Shakti) and groundwater extraction rates are among the highest in the world.

Over 30% of India's land is affected by degradation, and climate events—droughts, floods, heatwaves, Source: Food and Agriculture Organization (FAO) —are increasing in frequency, impacting crop yields by 10–40% in vulnerable regions.

To build a resilient agricultural future, India is advancing several transformational initiatives. These include the National Mission for Natural Farming (NMNF), the Digital Agriculture Mission (DAM), and expanding climate-smart agriculture practices. Additionally, integrating Activity-Based Costing (ABC) in agriculture is a critical financial tool that can help farmers, agribusinesses, and policymakers optimize costs, improve profitability, and make sustainable practices economically viable.

Three key national initiatives, National Mission for Natural Farming (NMNF), Digital Agriculture Mission (DAM), and Climate-Smart Agriculture (CSA), represent a paradigmatic shift towards ecological, technological, and climate-resilient farming. To strengthen these reforms, Activity-Based Costing (ABC) and the broader expertise of Cost and Management Accountants (CMAs) are crucial.

This article explores how these strategic initiatives can collectively build a resilient, sustainable, and food-secure India.

National Mission for Natural Farming (NMNF)

Launched in 2022–23, the National Mission for Natural Farming aims to transition farming away from chemical-intensive practices toward ecological and regenerative methods. This mission supports Bharatiya Prakritik Krishi Paddhati (BPKP) and emphasizes Zero Budget Natural Farming (ZBNF), bio-inputs, indigenous seeds, and on-farm resource recycling.

1. Why Natural Farming?

India uses over 62 million tonnes of chemical fertilizers annually, Source: Department of Fertilizers, Ministry of Chemicals & Fertilizers, Government of India.. While fertilizers have historically boosted yields, indiscriminate use has led to:

- declining soil organic carbon (reduced to 0.5%, from the ideal 1–1.5%),
- contamination of water bodies,
- reduction in biodiversity,
- lower nutritional value in produce.

The average Indian farmer spends nearly 30–35% of total cultivation cost on chemical inputs, while natural farming practices have demonstrated potential cost reductions of up to 70% (Source: NABARD; ICAR; NITI Aayog).

2. Key Features of NMNF

- Promotion of 100% chemical-free agricultural systems
- Establishment of Bio-Resource Centres (BRCs)
- Farmer training through Krishi Vigyan Kendras
- Financial assistance for model gaushalas and input preparation units
- Crop diversification with millets, legumes, and indigenous varieties

3. Impact and Progress

- Over 6 lakh farmers have adopted natural farming practices (Source: National Mission on Natural Farming, Ministry of Agriculture & Farmers Welfare).
- 26 states and UTs have included natural farming in their agriculture strategies.
- The government has identified a 75,000 km stretch along the Ganga for chemical-free agriculture to reduce river pollution (Source: Ministry of Jal Shakti; Ministry of Agriculture & Farmers Welfare).

Early results show:

- **30–40% reduction in input cost** (Source: ICAR; National Mission on Natural Farming, Government of India).
- 10–20% increase in soil moisture retention
- Improved climate resilience

However, yield comparisons vary. While some crops (millets, oilseeds, pulses) show similar or even higher productivity, high-input crops like

wheat and paddy may initially experience a 10–20% yield decline (Source: ICAR; NITI Aayog).

Digital Agriculture Mission (DAM)

The future of Indian agriculture is digital. Launched in **2021,** the Digital Agriculture Mission is designed to integrate technology across the value chain, enabling data-driven decision-making.

1. Key Technologies Driving DAM

- AI and Machine Learning for crop health monitoring
- GIS & Remote Sensing for land use mapping
- IoT-based soil and climate sensors
- Blockchain for traceability in agri-supply chains
- Drones for spraying, monitoring, and geospatial surveys
- Digital Public Infrastructure (DPI) for Agriculture, similar to UPI

2. Expected Outcomes

DAM aims to create a unified database of over 140 million landholdings, enabling farmers to access:

- digital advisory services,
- targeted subsidies,
- precision farming recommendations,
- crop insurance claims automation,
- e-market linkages.

3. Impact of Digital Agriculture: Facts & Comparisons

Parameter	Traditional Agriculture	Digital/Smart Agriculture
Input cost	High due to guesswork	10–15% reduction via precision
Water use	Inefficient; flood irrigation	30–40% saving with IoT sensors
Yield	Moderate	15–20% higher with data-driven farming
Market access	Limited to mandis	Nationwide digital marketplaces
Losses	20–30% post-harvest	Reduced through blockchain tracking

Digital farming can increase a farmer's income by 25–35% through efficient resource management and better market linkages.

Climate-Smart Agriculture (CSA)

Climate change is the greatest long-term challenge to agricultural sustainability. According to the Indian Council of Agricultural Research (ICAR), climate variability causes nearly **USD 10 billion** in annual economic losses to Indian agriculture (Source: ICAR).

Climate-Smart Agriculture is a strategy developed by the FAO and adapted for India to:

1. Increase productivity
2. Enhance resilience
3. Reduce greenhouse emissions

1. CSA Practices in India

1. **Micro-irrigation (Drip & Sprinkler)**
   - India has over 14 million hectares under micro-irrigation
   - Saves 40–50% water
2. **Drought-resistant and heat-tolerant seed varieties**
   - Over 1,200 climate-resilient varieties released
3. **Alternate Wetting and Drying (AWD) in paddy**
   - Saves 25–30% water
   - Cuts methane emissions by 50%
4. **Agroforestry**
   - India targets 33% tree cover by 2030 under NDC commitments
5. **Millet-based agriculture**
   - India produces 20% of global millet output
   - Millets require 70% less water than rice

6. **Carbon Farming**
   - Practices that earn farmers carbon credits
   - Global voluntary carbon market could reach $50 billion by 2030

2. Climate Vulnerability: Key Figures

- 1°C rise in temperature can reduce wheat production by 6%.
- Droughts affect nearly 33% of India's districts annually.
- Floods impact 50 million people and vast farmland every year.

CSA is therefore essential for future food security.

Activity-Based Costing (ABC) in Sustainable Agriculture

While technologies and environmental strategies are crucial, the financial sustainability of farming is equally important. Activity-Based Costing (ABC) provides farmers and agribusinesses with a more accurate method to allocate costs and optimize profitability.

1. Why ABC Is Needed in Agriculture

Traditional costing treats agriculture as a single activity. But modern farming involves:

- land preparation,
- irrigation,
- planting,
- fertilization,
- pest management,
- harvesting,
- storage,
- transportation.

ABC identifies cost drivers for each activity, enabling:

- better resource allocation,
- precise cost-benefit analysis of sustainable practices,
- identification of unprofitable farming activities.

2. ABC in Sustainable Farming: Comparative View

Parameter	Traditional Costing	Activity-Based Costing
Cost Allocation	Uniform, approximate	Based on actual activities
Decision Making	Limited	Data-driven
Input Cost Control	Weak	Strong—identifies high-cost areas
Sustainability Investments	Hard to justify	Clear ROI estimation

3. Benefits of ABC for Sustainable Agriculture

1. **Helps farmers compare costs of chemical vs. natural farming**
   - Natural farming may reduce costs by 70%, ABC quantifies these savings.
2. **Supports climate-smart investments**
   - Example: Drip irrigation's cost (~₹35,000/acre) vs. water savings and yield impact can be clearly mapped.
3. **Improves efficiency of FPOs and cooperatives**
   - Helps identify profitable crops and activities.
4. **Enhances policy-level decisions**
   - Governments can target subsidies to activities that offer highest environmental value.

4. Role of CMAs

Cost and Management Accountants (CMAs) play a crucial role by:

- designing ABC models for farms and agri-enterprises,
- analysing long-term financial viability of sustainable methods,
- auditing carbon farming and green project investments,

- supporting digital agriculture budgeting,
- helping governments allocate climate funds more effectively.

Conclusion:

India's path to agricultural sustainability requires a multi-dimensional approach. The National Mission for Natural Farming encourages ecological stewardship; the Digital Agriculture Mission leverages modern technology; climate-smart agriculture builds resilience against environmental shocks; and Activity-Based Costing ensures financial sustainability.

Together, these initiatives:

- reduce dependency on chemical inputs,
- strengthen farmers' income,
- protect natural resources,
- improve productivity,
- ensure safe and nutritious food for all,
- and build resilience against climate risks.

As India moves toward becoming a global leader in sustainable agriculture by 2047, integrating technology, innovation, environmental preservation, and financial management will create a farming ecosystem that is economically viable, ecologically sound, and socially inclusive.

A resilient and food-secure future depends not only on growing more food, but on growing it sustainably.

Sustainable agriculture is the cornerstone of India's journey toward a food-secure and resilient future. While ecological and technological reforms are essential, financial sustainability remains central to long-term success. By integrating natural farming, digital agriculture, climate-smart practices, and ABC-based financial accountability, India can create a robust agricultural ecosystem.

CMAs—through costing expertise, analytical skills, and sustainability-driven financial insights will play a defining role in shaping the agricultural economy of the future. Their involvement ensures that sustainability is not only environmentally beneficial but also economically profitable and socially inclusive. MA

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Congratulations!!!

CMA (Dr.) Raja Ghosh

Our heartiest congratulations to CMA (Dr.) Raja Ghosh, General Manager (F&A), Corporate Planning, WBSEDCL for being awarded with PhD in Management by ICFAI University Jharkhand, Ranchi on his Doctoral Thesis "Factors Determining CSR Matrix and its impact on Key Stakeholders in Indian Power Sector".

CMA (Dr.) Raja Ghosh is having a brilliant academic and professional career with over 30 years of experience in Power Sector Finance and Accounts. He is a FCMA, ACS, CFA, MBA (HR) (Gold Medalist) MBA (Finance), M Com, Certified CSR Professional and also holds an additional Certification in Arbitration from ICMAI and Forensic Audit from ICSI & KPMG.

We wish CMA (Dr.) Raja Ghosh the very best for all his future endeavours.

COST-BENEFIT ANALYSIS OF SUSTAINABLE AGRICULTURAL TECHNOLOGIES: AN INDIAN MANAGEMENT ACCOUNTING PERSPECTIVE

Abstract

Sustainable Agricultural Technologies (SATs) are receiving importance as strategic investments for increasing agriculture productivity, efficient use of resources and resilience in Indian agriculture. This study explores the financial stability of selected SATs namely integrated pest management (IPM), drip irrigation, organic nutrient management, precision farming and use of renewable energy through cost-benefit analysis. Analysing the capital budgeting tools such as NPV, BCR, Payback Period and sensitivity analysis, the paper appraises costs and benefits over a short run, medium-term and long run horizon considering Indian farming conditions. The empirical studies indicates that despite high initial investments, most SATs produce favourable financial outcomes, cost control and risk minimisation benefits over the life cycle. By connecting ESG considerations with conventional techniques, the study validates the role of management accountants for informed decision-making and promote sustainable value creation in long run.

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1. Introduction

Indian agriculture is facing various ongoing challenges such as declining soil fertility, water scarcity, rising operational cost and income instability of farmers *(Vasavi, 2025)*. In response, policy makers and agribusiness representatives are actively promoting Sustainable Agricultural Technologies (SATs), which boost

output while conserving natural resources *(Kumar S. , 2025)*. Adoption and implementation of such technology is a long-term capital budgeting choice rather than an agronomic one *(Zhan, 2025)*.

Traditional agricultural financial evaluation approaches usually focus on short-term profitability and cash flows, while disregarding long-term cost savings, risk reduction and environmental benefits *(Mazancová, 2024)*. The policy framework must be designed to focus on the integration of financial discipline with strategic decision-making considering fragmented, unorganised agriculture setup along with weak financial condition of farmers *(Hiranya, 2024)*. As a result, this study uses structured cost-benefit analysis approaches to examine if investments in SATs are economically viable in Indian agriculture sector *(Poudel, 2024)*.

2. Review of Literature

Empirical studies in agricultural economics suggest that precision farming and micro-irrigation significantly improve input-use efficiency and yield stability, particularly in water-scarce regions of India (Virley & Debarre, 2024). Research on Integrated Pest Management (IPM) and organic nutrient management highlights compact requirement on chemical inputs and improved soil health over time. However, implementation remains stressed by high upfront costs and limited access to capital.

Management accounting stresses the importance of life-cycle costing, environmental management accounting and sustainability reporting in investment assessment (Kumar S. C., 2023). Despite this, farm-level adoption of such analytical frameworks remains limited. This study bridges the gap by applying capital budgeting tools to sustainability driven agricultural investments (Kumar S. G., 2022).

3. Objectives of the Study

1. To explore significant sustainable agricultural technologies (SATs) relevant to Indian farming environment.
2. To compare costs and benefits (BCR) interlinked with selected SATs
3. To analyse the managerial and policy implications of adopting SATs in India

4. Research Methodology

This study adopts descriptive and empirical study design based on secondary data available in public domain and demonstrative farm-level evidence explored from literatures in Indian contexts.

4.1 Analytical Framework

The financial feasibility of sustainable agricultural technologies (SATs) is appraised using capital budgeting tools and techniques as discussed below:

Net Present Value (NPV):

$$NPV = \sum_{t=0}^{n} \frac{B_t - C_t}{(1+r)^t}$$

Where:

B_t = Benefits in year t

C_t = *Costs in year t*

r = *Discount rate*

n = *Project life*

Benefit–Cost Ratio (BCR):

$$BCR = \frac{\sum_{t=0}^{n} \frac{B_t}{(1+r)^t}}{\sum_{t=0}^{n} \frac{C_t}{(1+r)^t}}$$

Payback Period:

The Time required to recover initial cash outflows in adopting sustainable agricultural technologies (SATs) from net cash inflows. The discount rate considered for payback period is the prevailing lending rates for agricultural in India. The analysis covers a time horizon five-to-ten-years depending on the type of technology adopted (Johnston, 2018).

5. Cost–Benefit Analysis of Selected Sustainable Technologies

To reinforce empirical uniformity, this section presents suggestive quantifiable analysis based on available secondary data from literatures on agricultural studies in India, reports and collected farm-level evidences. The analysis focuses on pre and post impact of adoption of sustainable agricultural technologies (SATs) on costs, yields and profitability.

Table 1: Comparative Cost–Benefit of SATs

Technology	Initial Cost	Operating Cost	Major Benefits	Financial Impact
Drip Irrigation	H	Large Reduction	Increased Yield, Water Saving	Short payback period
Integrated Pest Management	LM	Reduction in pesticides	Lower crop loss, health benefits	High BCR
Organic Nutrients	L	Stable over time	Soil Fertility, Stable Cost	Long-term gains
Precision Farming	H	Moderate reduction	Cost Reduction, Increased yield	Positive NPV
Renewable Energy	H	Major energy cost saving	Energy security, cost control	Positive NPV over life cycle

H: High; L: Low; LM: Low to Moderate

Source: Compiled by authors based on World Bank, ICAR and peer-reviewed literature.

Table 2: Indicative Financial Performance of SATs (Per Hectare / Per Unit)

Technology	Increase in Yield (%)	Reduction in Input Cost (%)	Average Annual Net Benefit (₹)	Payback Period (Years)
Drip Irrigation	15–25	20–30	30,000–40,000	2–3
Integrated Pest Management	5–10	15–20	10,000–15,000	1–2
Organic Nutrients	3–7	10–15	8,000–12,000	2–3
Precision Farming	8–12	10–15	18,000–25,000	4–5
Renewable Energy (Solar Pump)	–	60–80 (energy cost)	35,000–50,000	4–6

Source: Compiled by authors based on World Bank, ICAR and peer-reviewed literature. Values represent typical ranges reported across regions and crops; actual performance depends on agro-climatic and management conditions.

5.1 Precision Farming

Precision farming shows consistent financial performance particularly for medium and large size farms. Empirical evidence indicates 8 to 12% yield improvement and 10 to 15%, through optimized input use, reductions in fertilizer and pesticide costs. Discounted cash flow analysis over seven-year horizon generally yields positive NPV with payback periods of four to five years. In spite of high initial investment in use of sensors and GPS-enabled systems long-term cost control and efficiency gains support financial viability when assessed using life-cycle costing.

5.2 Drip Irrigation

Drip irrigation system validates strong financial feasibility especially in horticulture and water-scarce regions. Studies report 15 to 25% increase in yields and up to 30% reductions in input costs, which led in short payback periods of two to three years and high Benefit–Cost Ratios. From capital budgeting standpoint drip irrigation represents low-risk investment with rapid cost recovery and substantial medium-term to long term savings.

5.3 Integrated Pest Management (IPM)

Integrated Pest Management requires nominal initial investment and yields quick financial returns. Empirical evidence and reports suggest 15 to 20% reductions in pesticide expenses with stable and marginally improved yields. Consequently, the IPM exhibits high BCRs and low payback periods thus making it financially viable even for small and marginal farms. Its primary benefit lies in cost

minimization rather than yield expansion.

5.4 Organic Nutrient Management

Organic nutrient management in agriculture provides gradual but stable financial benefits. The short-term yield advantages are modest ranging from 3 to 7% and 10 to 15% reductions in fertilizer costs and improved soil efficiency which generate positive net benefits over five to ten years. Financial appraisal favors long-term tools that capture cost stability and reduced dependency on external inputs.

5.5 Renewable Energy Applications

The implementations of renewable energy appliances particularly solar irrigation pumps and biogas systems reduce recurring energy costs by 60 to 80%. Although initial capital requirements are high and life-cycle discounted cash flow analyses indicate positive NPVs over 15–20 years, especially when supported by policy incentives. These investments enhance long-term cost predictability and operational resilience.

Practitioner Insight Box: Management Accountant's Perspective
ESG Investment: Evaluating Sustainable Agriculture

The finance professionals and management accountants must treat Sustainable agricultural technologies (SATs) as ESG focused and aligned capital investments rather than optional environmental overheads. Incorporating analytical tools such as life-cycle costing, discounted cash flow techniques and KPIs linked to sustainability; will enables more accurate assessment and long-term value creation for SATs. When environmental and social benefits such as reduced water usage, lower carbon emission and stable income are linked with financial characteristics, SATs will be proved to have strong alignment with ESG reporting, sustainability accounting.

6. ESG Impact Assessment of Sustainable Agricultural Technologies

Drip irrigation and organic nutrient management display strong environmental impact due to significant water conservation, improved soil fertility and efficient resource utilisation, resulting in positive overall ESG performance. Integrated Pest Management (IPM) brings positive environmental and social benefits through decreased chemical use and enhanced farm safety, though impact on governance remains moderate. Precision farming shows strong impact on governance owing to data-driven transparency and control, with positive environmental gains but moderate social connects. Use of renewable energy in agriculture have very high score environmentally due to reduction in carbon emissions and decrease energy costs, with high governance alignment to sustainability policies, yielding very high overall ESG impact. ESG scores (VH, H, M) represent relative qualitative assessments derived from synthesis of peer-reviewed literature and institutional sustainability frameworks. Scores are indicative and not based on a single standardized ESG rating system

Table 3:ESG Impact Scoring Matrix for SAT

Technology	Environmental (E)	Social (S)	Governance (G)	Overall ESG Impact
Drip Irrigation	VH	H	M	VH
Integrated Pest Management	H	H	M	H
Organic Nutrients	VH	H	M	VH
Precision Farming	H	M	H	H
Renewable Energy	VH	M	H	VH
VH: Very High; H: High; M: Medium				

Source: Authors' conceptual framework based on FAO sustainability indicators, OECD agri-environmental metrics, World Bank ESG guidance and UN SDGs.

6.1 Drip Irrigation (E: VH, S: H, G: M, overall: VH)

Drip irrigation demonstrates very high environmental impact driven by substantial water conservation and energy efficiency. Social benefits arise from improved productivity and income stability for farmers resulting in a high social score. Governance impact is assessed as medium and reflecting dependence on institutional support, subsidies and implementation oversight. Thus, drip irrigation delivers very high ESG impact.

6.2 Integrated Pest Management (E: H, S: H, G: M, overall: H)

Integrated pest management shows high environmental impact due to reduced chemical use and lower ecological toxicity. Social impact is also high as reduced pesticide exposure enhances farmer health and safety. Governance impact remains medium as effective adoption depends on training, extension services and compliance with recommended practices. The overall ESG impact of IPM is assessed as high.

6.3 Organic Nutrients (E: VH, S: H, G: M, overall: VH)

Organic nutrient management attains very high environmental impact by improving soil health, biodiversity and long-term ecological balance. Social benefits are high stemming from sustainable livelihood support and reduced reliance on costly chemical inputs. Governance impact is medium which is influenced by certification, quality assurance and monitoring mechanisms thus overall ESG performance is very high.

6.4 Precision Farming (E: H, S: M, G: H, overall: H)

Precision farming delivers high environmental impact through optimized resource use and reduced input wastage. Social impact is assessed as medium reflecting unequal accessibility due to capital and skill requirements. Governance impact is high as data-driven systems enhance transparency, traceability and operational control hence overall ESG impact of precision farming is high.

6.5 Renewable Energy in Agriculture (E: VH, S: M, G: H, overall: VH)

Renewable energy applications exhibit very high environmental impact by reducing carbon emissions and fossil fuel dependence. Social impact is medium as benefits related to energy security and cost stability are unevenly distributed across farm sizes. Governance impact is high reflecting strong alignment with regulatory frameworks and national sustainability policies thus overall ESG impact is assessed as very high.

7. Managerial and Policy Implications

The managerial and policy implications are from a management accounting perspective where the implementation of Sustainable agricultural technologies (SATs) should be evaluated using life-cycle costing of the technology rather than analyzing short-term expense. Inclusion of environmental factors and risk reduction improves the precision of investment decisions. Policymakers can accelerate implementation of SATs through capital subsidies, concessional financing and training support. Management accountants have critical role in designing sustainability-oriented performance measurement systems.

8. Limitations and Scope for Further Research

This study is primarily based on literatures and reports available, secondary data and suggestive farm-level empirical studies, which may not fully include regional variations across India's diverse climatic regions. Cost-benefit estimations are subject to assumptions regarding productivity, prices, lending rates and discount rates. Future studies may employ primary survey data, region-specific financial models and longitudinal studies to consider dynamic impacts of SATs implementation. Further studies may also integrate carbon valuation and monetization of environment into management accounting frameworks.

Conclusion

This study concludes that adoption of sustainable agricultural technologies (SATs) is commercially viable when assessed using structured cost–benefit tools and techniques for medium to large size farms. Even though initial investments and cash outflows

are higher but the financial returns in long-term, cost efficacies and flexibility benefits justify the acceptance of SATs. Implementing sustainability into management accounting practices can further strengthen decision-making and support India's transition toward sustainable agriculture society in medium to long term perspectives. MA

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TRANSFORMATION OF AGRICULTURE INTO SUSTAINABILITY- USE OF TECHNOLOGICAL ADVANCES

Abstract

The present paper appreciating the need for transforming agriculture into sustainable, delineates how developments in science and technology combine with AI, ML, IoT and data analytics lead to smart farming to counter the challenge of food security and climate change in the global context. The focus of transformation of agriculture in different countries and organizations is presented. The need for supporting infrastructure has been stressed for effective use of technological advances amongst the marginal farmers in a country.

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Introduction:

As the global population grows to approximately 9 billion by 2050, the world's farmers need to grow 50% more food to meet the needs of the growing world (FAO, 2009). But the arable land is shrinking due to urbanization and degradation. With catastrophic climate changes, 70% of world's fresh water supply is being used now in agriculture. Worsening soil issues due to climate change, shortage of labour force, pest damage add to the challenges faced by farmers. In fact, the world's food systems face enormous challenges of changing climate, a decline in biodiversity, limited natural resources, global crisis, and above all the growing population. This leads to an absolute necessity for agricultural transformation.

The Green Revolution in agriculture of the 1960s made impressive strides between 1961 and 2004. Cereal yields in East Asia improved by 2.8 percent a year or over 300 percent over the period. This was enabled by modern farming practices, including irrigation, use of fertilizers and pesticides, and the development of new and more productive crop varieties (World Development Report, 2008). Gradually, the wave of automation started spilling into the fields, the tractor was introduced, followed by new tillage and harvesting equipment, irrigation and air seeding technology, all leading to higher yields and improved quality of the food.

The digital agriculture began since the early nineties when GPS was first mounted on tractors. Sensors placed in fields allow farmers to obtain detailed maps of both the topography and resources in the area, as well as variables such as acidity and temperature of the soil. Moisture sensors in the ground are able to communicate information about the level of moisture present in the soil. Instead of prescribing a fertilizer map for a field, crop sensors direct application equipment how much to apply in real time. By using the correct sensors, drones can provide today's farmers with real-time information regarding their crops, soil deterioration, dry regions, fungal infections. Digitalization has also enabled farmers to use their phone camera to identify a pest or a disease. Of course, the credit for the biggest digital transformation, be it in agriculture or for any sector, goes to Coronavirus, the world after

Corona became digitized more than ever.

But in spite of all those advancements in digital agriculture, hunger and malnutrition are spreading faster today when nearly 350 million people are already experiencing the most extreme forms of hunger. Since the beginning of 21st century, global GHG emissions had followed an increasing trend, 25% increase from 1990 to 2024, posing climate change a big challenge. During earlier days, increasing crop production and reversing environmental damage were considered incompatible, but now the global agriculture scene is changing. Today it is how to produce more with less so that we can conserve our resources, how to reverse the trend of soil degradation, how to reduce carbon footprints and start storing carbon in soil and plants instead to counter the climate challenge. The goal is to achieve both productivity and sustainability and enhance farmers' welfare not only today but also for the future, encouraging still more development for sustained agriculture (as reflected in the Fig.-1).

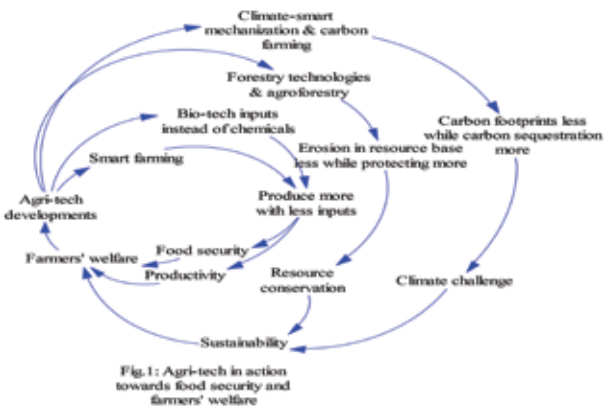

Fig.1: Agri-tech in action towards food security and farmers' welfare

Agricultural technology advancing:

With focus on sustainability, agroforestry proved itself a sustainable approach integrating trees with farming. Regenerative practices in sustainable agriculture focus on rebuilding soil health, increasing biodiversity, and improving water cycles, using techniques like no-till, cover cropping, crop rotations, integrating livestock, and agroforestry to sequester carbon, reduce chemical inputs, and create resilient farms that give back more to the land than they take. Choice of such strategies is reflected in the Table-1.

Table-1: Choice of farming strategies with positive impact on soil

No.	Farming practices	Impact on soil
1.	Moving towards no-till farming	Preserves soil structure and biology
2.	Use cover crops, mulching and leave crop residues to protect soil from erosion and retain moisture	Protects soil from erosion and retain moisture
3.	Diversify crops like crop rotation and intercropping	Breaks pest cycles and improve nutrient cycling
4.	Combine crops, agroforestry, integrate livestock	Creates resilient farm ecosystems
5.	Avoid use of chemicals and monoculture	Minimizes biodiversity loss
6.	Use biological inputs instead of synthetic fertilizers/pesticides	Enhances soil carbon, fertility and plant resilience
7.	Variable input rate application using drones	Balances between nutrient deficiency and toxicity
8.	Practice carbon sequestration through: i)Biologically through reforestation & afforestation ii) Technologically by pulling carbon dioxide from atmosphere and storing it in soil and plants	Enhances soil fertility and water holding capacity and to reduce GHG

With developments in agronomic sciences in all facets of plant genetics, plant physiology, Gene biotech innovations develop crops with climate resilient high yield (using minichromosome technology), pest/drought resistance, improved nutrition, higher yields and better sustainability with less water and energy to tackle climate change and food security. With AI and digital twin technology, we simulate different seed varieties how they respond to various soil and weather

conditions in the breeding platform to achieve desired performance targets as well as consumer demands (as presented in the Fig.2).

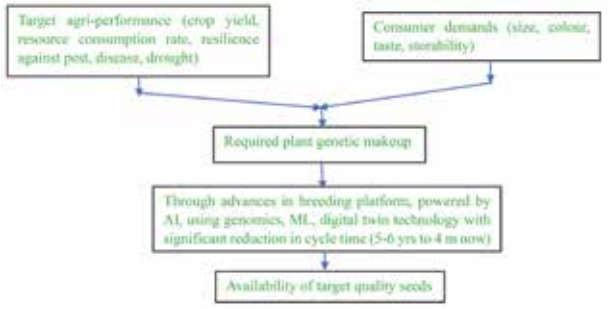

Fig.-2: Tech advances: Seed-Farming scenario

AI is the core technology in powering the digital transformation of agriculture through advances in application technology and data science which helps tackle simultaneously climate change and ensure global food security, balancing productivity with ecological responsibility. The agricultural sector is moving towards precision farming in irrigation, weeding, plant and environment monitoring to use of renewable energy and digital platforms as reflected in the Table-2. ”Data is the new soil, AI the nervous system and biotechnology the new structure” as said by Debjani Ghosh, NITI Aayog of India, 2025.

Table-2: Technology-driven smart farming leads to productivity and sustainability

No.	Tech-driven smart farming	Impact
1.	Use farm management platforms with digital mapping using satellite imagery with GPS technology, workflow automation, AI technologies like ML, computer vision, data analytics and IoT-enabled sensor networks to collect weather & rain pattern, soil and air-quality data	Real-time decision making for smart farming from planting to harvesting to boost yields, reduce input costs, and protect environmental health
2.	Precision sowing, planting of seedlings using machines and robots	Ensures accuracy in depth, spacing and positioning to enhance crop uniformity and reduce labour cost
3.	Precision irrigation using IoT-based soil-moisture sensors and pilot generative AI tool triggering automated irrigation (along with water-soluble nutrients for IoT-based precision fertigation systems) at right time for the right amount charged at the roots through the sprinklers/ drip system	Optimise resource consumption, plant growth and soil protection
4.	Precision weeding, locating weeds in particular using AI-powered robotics with computer vision camera, using tillers for uprooting weeds, and spray chemicals on weeds, pesticides for insect and disease control instead of blanket spray	To reduce the consumption and protect plant
5.	Automated remote monitoring of environment conditions and pest populations using drones and precision tools	To predict and prevent outbreaks before they harm crops
6.	Use renewable energy solutions for irrigation and food storage (particularly in regions with erratic power supply) instead of fossil-fuel systems	To reduce farm carbon footprints and provide reliable energy enhancing both productivity and sustainability
7.	IoT-based farming maintains optimal growing conditions	To achieve higher yields with less energy thereby enhancing efficiency and sustainability
8.	Use IoT and block chain to track agricultural goods from farm to fork	Streamlining logistics and improving traceability, strengthening consumer confidence supporting food safety, quality, and efficiency throughout the agricultural supply chain

9.	IoT sensors monitors machine performance along with alerts when operating parameters are out of range or malfunctions occur	Enabling preventive steps and reducing downtime
10.	Use of controlled environment like vertical farming, hydroponics or aeroponics	Minimizes external dependencies and maximizes controllability
11.	Use of automated sorting and grading machines, IoT-enabled ripening chambers and cold storage with ethylene control	Effective harvest management and storage
12.	Online agricultural market place solutions and digital backed credit for the upcoming season	Effective market linkage and funds availability

Agri-tech scenario in practice:

Around other countries:

Global tech-enabled sustainable agriculture shows high adoption rate in the North America and rapid growth in Latin America and Asia. Precision agriculture has been the primary tech-driver with a global market valued over $11 billion in 2024. North America leads with a 60% adoption rate in 2024. Europe maintains a 55% adoption rate, although recent trends indicate 7% drop. Latin America shows the fastest-growing region, reaching a 75% /adoption rate. The adoption rate of Asia-Pacific varies widely; while advanced nations like Japan and Singapore are key players, the region's overall tech adoption has been lower at roughly 10% due to the prevalence of small-scale farming (McKinsey & Company, 2024).

Indian scenario:

If we look at India, it has around 160 million hectares of arable land (second behind U.S.) and almost half of its population depends on agriculture for their livelihood. Though its agriculture contributes nearly 20% to its national GDP, the productivity per hectare (except for the irrigated wheat approaching world standards) is lower than leading nations like the China, U.S., and Europe. The small farm size of India restricts individual farmers to continue mostly with traditional farming practices. India uses around 85% chemical fertilizers (being the, world's second-largest user and third largest producer) to maximize crop yield. However, use of chemicals has its usual pitfalls of environmental damage.

To deal with such challenges, the government of India had made lot of efforts in the mean while and launched centrally sponsored schemes like the National Mission on Agricultural Extension and Technology (NMAET in Feb 2014) to deliver modern technology and improved agronomic practices available to farmers and the National Mission for Sustainable Agriculture (NMSA) under the eight missions for the National Action Plan on Climate Change (NAPCC in 2014-15) to improve soil health, water use efficiency (Per Drop More Crop) and integrated farming systems. With the Digital India Program (launched in July 2015) had already made India into a digitally empowered society with a mobile in the hands of each and every farmer at the length and breadth of the country, the honourable prime minister of India announced the bold vision of Viksit Bharat 2047 (Dec 2023) to transform the country into a fully developed and self-reliant nation. Agriculture being the key driver of Viksit Bharat with half of its population in agri-food system, the Digital Agricultural Mission 2.0 was launched by the government of India through its apex public policy think tank, NITI Aayog (National Institution for Transforming India) in Nov, 2025. Its objective is to transform agriculture from input-based to intelligence-driven using AI, IoT and data analytics focusing on three broad areas: development of agri-system and practices to take the advantages of the digital infrastructure; revamping the institutional innovation system towards interdisciplinary industry-based research and setting up centres of excellence and policy foresight units to converge public-private efforts to accelerate the transformation process for three-fold increase in agriculture sector, enabling the Indian economy for five-fold increase by 2047 as envisaged in the Viksit Bharat 2047.

Around various organizations:

AgroStar is a leading AgTech start-up in India with a portfolio of 200 plus high-quality farm inputs with innovative bio and organic alternatives, partially replacing chemical fertilizers reducing emissions, increasing yields, reducing cost of cultivation and impact on the environment.

Cropin, the world's first real-time, generative AI agri-intelligence platform, powered by largest crop knowledge grid spanning over a billion acres of land, 400 crops of 10,000 varieties across 103 countries since 2010 transforms the past, present and future of crops data into better decisions.

DJI Agriculture (Da-Jiang Innovations), drones used for spray pesticides with high precision on wheat fields in Punjab and paddy fields in AP, Matrice series drones with multispectral and thermal cameras and sensors for crop health analysis helping farmers to save time, reduce health hazard from chemicals, minimize cost and increase crop productivity.

E.L.Y. (Expert Local Yield/Intelligence) GenAI expert system developed by Bayer Crop Science in collaboration with Microsoft and EY (AI-based AgTech Solution of the Year 2025 breakthrough award winner) quickly and accurately answers questions related to agronomy, farm management, thus benefiting farmers all over the world

Intello Labs digitizes food quality using image matching, machine learning and data analytics to gauge the quality of crops and outputs detecting any change from prescribed specifications and offers complete automation in supply chain management, fair pricing and reducing food wastage

KrishiMitra, the AI copilot showcased at World Agri-Tech 2024 with image analytics feature supports farmers with IoT crop monitoring, suggests soil nutrition based on soil characteristics, real-time identification of pest along with its timely resolution, notification-based, crop-specific periodic advisory system.

Niqo Robotics, AI-powered BrijBot to assist small farmers with precision weeding, identify and selectively spray chemicals on weeds, pesticides for insect and disease control using AI, computer vision to distinguish between crops and unwanted plants, reducing chemical and water usage compared to traditional blanket spraying.

Plantix, an AI-powered mobile app, uses image recognition to identify pests, diseases, and nutrient deficiencies, provides customized treatment plans, offering both organic and chemical solutions for over 30 major crops and 780 plus plant damage, also real-time tracking and alerts for any nearby potential disease outbreaks and expert advice through global social network

SatSure's platform monitors through satellite imagery, machine learning, big data analytics and cloud infrastructure tracking crop growth and health across regions from germination to harvest for farmers (Sparta), fintech oriented crops' risk-return suite for lending institutions and years of crop data mapped across seasons and regions (Digital AgriStack).

Conclusions:

Development in sustainable agricultural technology is indeed a boon for large farms. They can assess the risk-return of tech adoption and go ahead depending on their needs. But for a country like India, where we are dealing mostly with marginal farmers with nominal land holding, they cannot think of deciding in favour of such tech-adoption. To catalyse technological renaissance in the country's agriculture, full-fledged supporting infrastructure needs to be put in place first and the supporting body needs to be proactive with effective delivery mechanism of tech-innovations, then only country's marginal farmers will be convinced to adopt the sustainable tech-aided practices. MA

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GLOBAL MONEY, GLOBAL GOALS: RETHINKING TRANSNATIONAL FINANCE FOR THE SDGs

Abstract

Despite substantial efforts to mitigate climate change (CC) by initiating measures to increase climate finance (CF), lower emissions, and control the consequent heating, CC is becoming a more significant risk by the day. More targeted and effective measures are required to control the factors that cause CC and reverse the damage already done. Extensive investment is required to achieve both these objectives, making CF an essential part of the efforts to combat CC effectively. The availability of funds has indeed been one of the most significant impediments for many countries, reducing the momentum of their efforts to control emissions and institute other measures. One way of addressing the issue is to direct efforts towards scaling transnational finance. It can be achieved via 1) Supporting lower-middle-income countries (LMICs), 2) Expanding and delivering concessional finance, 3) Aligning with the Paris Agreement and UNFCCC's goals, and 4). Addressing the mitigation and adaptation gaps.

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Introduction

The 2020s have seen a rising number of climaterelated natural disasters, with 2023 marked with floods, hurricanes, and droughts. Governments and businesses were compelled to examine the financial risks and their potential exposure to liability in greater detail. As per world economic forum, three of the costliest natural disasters of the decade occurred in 2022, and insurers felt the pinch. Dystopian flooding in Pakistan caused $40 billion in damages, catastrophic summer heatwaves in Europe cost over $10 billion, and Hurricane Ian devastated Florida and South Carolina for $100 billion. There is a substantial aggregate unequivocal risk to the economy and the financial system from climate change (CC). Potential sources of risk include uncertainty about where the economy will go in the future, how the climate will change, and how the different parts of the model will change concerning CC. The top five climate risks identified by policymakers for the next thirty years are physical, regulatory, technological, stakeholder, and legal (Stroebel & Wurgler, 2021). We need financial resources and sound investments to combat climate change.

Climate finance (CF) has arisen as a potent instrument for combating CC, directly facilitating many Sustainable Development Goals (SDGs) via specific financial structures. CF allocates resources to diminish emissions (SDG 13: Climate Action), improve adaptation (SDG 13.1), alleviate risks for at-risk populations (SDG 1: No Poverty), and strengthen resilience in essential sectors like as agriculture and water (SDG 2: Zero Hunger). The Green Climate Fund's $100 million initiative in Bangladesh's Sundarbans promotes cyclone-resilient infrastructure and mangrove restoration, reducing emissions by 1.5 million tons CO_2e per year and enhancing the livelihoods of 1 million coastal inhabitants, thereby connecting Climate Finance to Sustainable Development Goal 11 (Sustainable Cities) and Sustainable Development

Goal 14 (Life Below Water) (Climate Impact Partners. (2023)).

The term "climate finance" is yet to have an international definition. As per the United Nations Framework Convention on Climate Change (UNFCCC), "CF refers to local, national, or transnational financing—drawn from public, private, and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address CC." Finance is one of the most critical components required to address CC. It is covered by a wide range of mechanisms—funding sources, financial instruments, projects and activities, institutional arrangements, oversight, and governing bodies. CF is critical for mitigation and adaptation. Effective climate mitigation requires significant investments and extensive international cooperation (K. Zhang & Liang, 2020), which reduces the cost of emissions. Furthermore, large-scale investments are required to adapt to and decrease CC impacts.

CF is equally essential for adaptation, as significant financial resources are needed to adapt to the adverse effects and reduce the impacts of a changing climate. Pacific Small Island Developing States are particularly sensitive to Green Climate Fund (GCF) post-2020 allocation changes. The GCF must help climate-vulnerable developing nations. Transnational finance—cross-border funding flows from developed to developing countries, including multilateral funds like the GCF and private investments—must increase to mobilize the scale of resources needed for effective adaptation.

Scaling transnational finance

Transnational finance needs to go up to address the climate challenges. The method of increasing transnational finance is classified into four broad themes:

1. Support lower-middle-income countries (LMICs),
2. Expand and deliver concessional finance,
3. Align with the Paris Agreement and UNFCCC's goals, and
4. Address the mitigation and adaptation gaps.

Figure 1: Scaling Transnational Finance

1. Support lower middle-income countries (LMICs)

a. *Develop countries to honor commitment:* The LMICs need tremendous support to meet the challenges of climate change. As per OECD, Financial support to LMICs can be provided by honoring a commitment of $100 billion annually by 2020 made in COP15 in 2009 by developed countries. Though this amount is miniscule when compared with the requirements. Wealthy nations are yet to honor their commitment of $100 billion annually in climate funding, which was intended to commence in 2020. The United States, the most significant underperformer in delivering the pledged assistance, is currently the second-largest emitter of greenhouse emissions. According to Jake Schmidt, a senior strategic director of international climate at the Natural Resources Defense Council, the United States allocates less funding for international climate finance than Spain, despite Spain's economy being 16 times smaller.

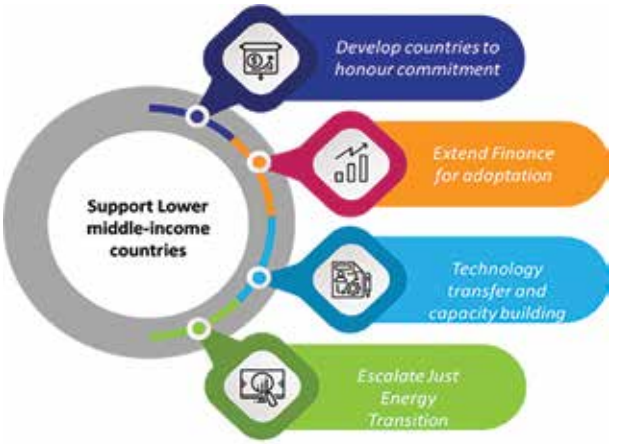
b. *Extend Finance for Adaptation:* The adaptation finance needed by LMICs is immense and should be designed to address the specific and complex set of vulnerabilities. International investment aimed at climate adaptation is neither contextualized nor specifically directed to enhance the adaptive ability of individuals residing in communities that are particularly susceptible to climate shocks and affected by conflict.

c. *Technology transfer and capacity building:* Along with the transfer of funds, the technology transfers and capacity building are critical instruments of leverage. It is essential to ascertain the most effective methods for scaling up strategies to enhance the targeting and efficacy of adaptation funding (to facilitate

capacity building) and technology transfer (to assist local communities in adapting). From a research standpoint, methodologies are required to assess the sufficiency of existing climate adaptation responses and to further analyze the circumstances under which climate adaptation technology may provide beneficial or detrimental effects in agriculture and food systems.

d. *Escalate Just Energy Transition partnerships:* To phase out coal and scale up renewables, the "Just Energy Transition Partnership" (JETP) was announced in COP 26. Countries like South Africa and Indonesia are utilizing monies from the Clean Technology Fund to invest in their JETPs to expedite the early decommissioning of coal power facilities, enhance renewable energy, and facilitate a just transition.

Figure 2: Support Lower middle-income countries



2. Expand and deliver concessional finance.

a. *Concessional financial instruments:* Among all sources of money, concessional financing from bilateral donors is the most critical component. Whilst the total amount of official concessional financing has increased, it is still insufficient to meet the most pressing demands. Developing countries are insisting that the developed world should provide public grants and low-interest loans through expanded aid to meet climate goals. However, contributors prefer to lend money for carbon-cutting projects and mobilizing private finance where possible.

b. *Address unfair debt burden:* Debt burden arises primarily due to loans extended for CF. Debt-heavy investments are unsustainable alternatives that often come with unfavorable conditions, particularly as many developing countries are already in debt burdens, which has been aggravated by the pandemic. Providing climate finance in the form of loans would be tightening the shackles of this debt trap at the worst possible time.

c. *Increase bilateral funding:* The other way of providing concessional finance is by increasing bilateral funding by developed nations. Many countries this year have made commitments towards the same. France declared its intention to allocate EUR 20 million in subsidies to the Global Shield Against Climate Risks, which supports the most vulnerable nations in addressing climate-related loss and damage. The United Kingdom (UK) declared an augmentation in financial assistance for climate change to the most impoverished African nations. UK Foreign Secretary James Cleverly said that the UK would allocate GBP 200 million to the AfDB's Climate Action Window, which directs climate funds to at-risk African nations.

Figure 3: Expand and Deliver Concessional finance

3. Align with the Paris Agreement and the United Nations Framework Convention on Climate Change goals.

a. Operationalize *the loss and damage fund:* The provision of a "loss and damage" fund

(LDF) for vulnerable nations affected hard by climate disasters is one of the most significant achievements of the UNFCCC COP27. There must be a concerted effort by wealthy countries to address this pressing global issue, or the damage will worsen. The rich countries earlier opposed the LDF, and they demanded that they would support a fund if the donor base were broadened. Setting up LDF is a historical step, but how it will work is still unknown. It is not clear what the size of LDF will be and how it will function. Quantification, assessment, attribution, payment monitoring, and evaluation and optimization are yet to be finalized.

b. *Stock of progress by Global Stocktake:* The Global Stocktake (GST) of the Paris Agreement assesses the world's progress towards meeting the agreement's purpose and long-term goals, particularly in finance, technology, mitigation, adaptation, capacity building, etc. It is essential to take stock of the implementation of the Paris Agreement. It will independently evaluate the progress countries have made and if their goals were adequate. It will inform everybody, every single day, everywhere in the world, what they need to do to avert the climate crisis.

c. *Implement New Collective Quantified Goal (NCQG):* The developing countries pushed for NCQG on CF, as they want rich countries to take responsibility for a sustainable future; also, they demanded that the CF definition should include the principles or characteristics of the NCQG. The NCQG is expected to be finalized soon, as currently there is a lack of an implementation plan for the same.

d. *Deliver on other climate funds:* Developed countries should provide financial resources to developing countries under the Kyoto Protocol of UNFCCC and other mechanisms of UNFCCC, like the Green Climate Fund (GCF), Clean Development Mechanism (CDM), and Global Environment Facility (GEF), which facilitate the provision of climate finance from the Parties with advanced financial resources to the more vulnerable Parties.

Figure 4: Align with Paris Agreement and UNFCCC goals

Mitigation and Adaptation Gap

a. Inadequate adaptation finance: To increase transnational finance, the gap between the mitigation and adaptation (M&A) needs to be addressed. There is insufficient adaptation finance (AF). There is the gap between current levels of adaptation finance and what is needed to respond to climate impacts. One of the reasons why there is a bias towards mitigation is because the monetary inflows associated with it are observable, and there is difficulty in measuring successful adaptation.

b. Thematic split tilted towards mitigation: While funding is being received for climate mitigation, adaptation losses are out on finance, which results in huge gaps. Globally, the preponderance of climate finance has been allocated to mitigation initiatives, resulting in minimal funding for adaptation efforts. From 2000 to 2019, it was anticipated that 65% of all climate financing was allocated to assist mitigation programs, which are frequently regarded as much more profitable investments. Moreover, the majority of adaptation financing was allocated to impoverished nations, while most mitigation finance was directed towards middle-income countries, which are generally more financially accommodating and conducive to business.

c. Renewable energy is highest in mitigation: Within the mitigation finance sector, energy is receiving the highest funding. The global thematic division indicates that of the $83

billion, $49 billion was allocated to climate mitigation efforts, primarily targeting cleaner energy and transportation, while approximately $28 billion was expended on climate adaptation, chiefly for agriculture, water supply, forestry restoration, coastal fishing, and sanitation. The $49 billion worldwide mitigation investment in 2020 is insignificant compared to India's $250 billion requirement for renewable installations by 2030. The UN Secretary-General emphasized with concern that the adaptation funding requirements of developing nations will surge to $340 billion per year by that time. It is evident that we face an expanding chasm to close.

Figure 5: Mitigation and Adaptation Gap

Future research directions

This study opens several avenues for future research that can deepen the understanding of this domain. One, considering the essential nature of transnational finance, it would be valuable to obtain perspectives from policymakers regarding the obstacles they encounter within this realm. Second, data can be gathered via the administration of interviews with individuals engaged in this field. Likewise, it is possible to conduct interviews with scholars, researchers, economists, and financial experts to provide additional insights for the development of policies. Thirdly, additional research endeavours could delve more profoundly into each theme and potentially propose a theoretical framework for every aspect of CF. MA

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Obituary

CMA Nav Ratan Gupta

The Institute and its members deeply mourn the demise of CMA Nav Ratan Gupta, Director (Finance), Bridge and Roof Company (India) Limited, Kolkata, our Beloved Member of the Institute on 16th January, 2026 at Kolkata.

CMA Nav Ratan Gupta had 34 years of post-qualification extensive experience in Finance and Accounts in Industries and had worked with many Prestigious Companies. Throughout each position, he demonstrated a consistent ability to drive financial performance, ensure compliance, and implement strategies for cost savings and growth. Driven by a deep respect for the skills and values to CMAs fraternity, CMA Gupta inspired his entire family to join on this path thus elevating CMA from individual to family passion.

May God bless the family to have the courage and strength to overcome the irreparable loss.

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NBCC (India) Ltd. proudly celebrates the GRIHA 4-Star rating for Bharat Mandapam, recognizing it as a model of sustainable development. This state-of-the-art facility at Pragati Maidan reflects our unwavering commitment to eco-friendly innovation, seamlessly combining modern design with environmental responsibility to shape India's green future.

The award celebrates the project's excellence in adhering to 31 sustainability criteria, reducing energy consumption, promoting renewable energy, and fostering a greener urban landscape.

एनबीसीसी (इंडिया) लिमिटेड
(भारत सरकार का उद्यम)
NBCC (INDIA) LIMITED
(A Government of India Enterprise)

ADOPTION OF ACTIVITY-BASED COSTING IN INDIAN AGRI-BUSINESSES: AN EMPIRICAL STUDY ON COST ACCURACY AND MANAGERIAL DECISION-MAKING

Abstract

This study empirically examines the adoption of Activity-Based Costing (ABC) in Indian agri-business organizations and its impact on cost accuracy and managerial decision-making quality. Using primary data from 202 accounting and managerial professionals working in agri-business firms, Farmer Producer Organisations, cooperatives, and agri-processing units across India, the study adopts a quantitative research design. Descriptive statistics, reliability analysis, correlation analysis, and regression techniques were employed for data analysis. The findings indicate a high level of ABC adoption and show that ABC adoption has a significant positive effect on cost accuracy. Cost accuracy is also found to be a strong predictor of managerial decision-making quality, highlighting the importance of reliable cost information for pricing, budgeting, and strategic decisions. The study contributes to management accounting literature by extending empirical evidence to the agri-business sector and offers practical insights for managers and accountants.

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Introduction

Agri-businesses operate in environments characterised by biological uncertainty, market volatility, and increasingly complex cost structures. In recent years, Indian agri-business organizations, including Farmer Producer Organisations, cooperatives, and agri-processing units, have faced growing pressure to enhance cost efficiency while responding to demands for competitiveness, transparency, and sustainability. In such contexts, accurate cost information is not merely an accounting requirement but a strategic necessity supporting pricing, budgeting, and investment decisions. Management accounting systems are therefore expected to evolve beyond basic cost aggregation toward decision-support mechanisms that reflect actual resource consumption (Kaplan & Cooper, 1998).

Ideally, costing systems in agri-businesses should allocate indirect and overhead costs in ways that

mirror operational realities and activity intensity. However, many organizations continue to rely on traditional volume-based costing systems that inadequately capture the diversity of activities involved in procurement, processing, logistics, quality control, and compliance. This misalignment often produces distorted cost information, resulting in mispricing, inefficient resource allocation, and weakened managerial decision-making (Drury, 2018). The gap between ideal costing practices and actual application remains a persistent managerial challenge, particularly in sectors characterised by heterogeneous activities and substantial indirect costs.

Activity-Based Costing addresses these limitations by assigning costs to activities and tracing them to outputs through appropriate cost drivers rather than broad volume measures (Cooper & Kaplan, 1991). Empirical research in manufacturing and service sectors shows that ABC improves cost accuracy and enhances decision-relevant accounting information (Bhimani et al., 2019). However, empirical evidence from the agri-business context, particularly in emerging economies such as India, remains limited, fragmented, and largely descriptive.

Inaccurate cost information leads to mispricing, inefficient budgeting, and weakened strategic planning. Addressing this gap, the present study empirically examines ABC adoption in Indian agri-business organizations and analyses its impact on cost accuracy and managerial decision-making quality, grounded in the decision-usefulness perspective of management accounting theoretically.

Review of Literature

Activity-Based Costing (ABC) has been positioned in management accounting literature as a response to the limitations of traditional volume-based costing systems in increasingly complex organizational settings. ABC is grounded in the principle that activities consume resources and outputs consume activities, enabling accurate tracing of indirect costs through activity cost drivers (Cooper & Kaplan, 1991). This approach is relevant for agri-businesses, where procurement, processing, storage, quality assurance, and distribution create heterogeneous cost structures that challenge conventional costing practices.

Early empirical research on ABC adoption has largely focused on manufacturing and service organizations. Kaplan and Cooper (1998) demonstrated that ABC enhances cost transparency and managerial understanding of cost behaviour, while later studies linked ABC adoption to improved cost control and strategic decision-making (Bhimani et al., 2019). Despite these contributions, such studies rarely account for sectoral differences, and agri-business contexts remain marginal within mainstream ABC research.

Studies examining the extent of ABC adoption report mixed findings. Evidence from developed economies suggests selective adoption, constrained by implementation costs, system complexity, and organizational resistance (Gosselin, 1997; Al-Omiri & Drury, 2007). Indian studies indicate growing awareness but uneven adoption, largely concentrated in larger manufacturing firms (Joshi, 2001). As agri-business organizations are seldom included, the extent of ABC adoption within Indian agri-businesses remains insufficiently understood, motivating the first objective of this study.

A second stream of literature analyses the impact of ABC adoption on cost accuracy. Empirical studies show that ABC reduces cost distortions and cross-subsidisation among products (Innes & Mitchell, 1995). Drury (2018) further argues that ABC improves the reliability of cost information by aligning costs with resource consumption. However, much of this evidence relies on case studies, limiting generalisability and leaving agri-business environments underexplored, thereby justifying the second objective of this study.

Research grounded in the decision-usefulness perspective links cost accuracy to managerial decision-making quality. Chenhall and Morris (1986) and Abernethy and Lillis (2001) demonstrate that accurate cost information enhances planning, control, pricing, and strategic decisions. Yet cost accuracy is often treated implicitly, and empirical examination of its direct effect on decision-making in agri-businesses remains limited. Addressing this gap underpins the third objective of this study.

Data and Methodology

This study adopts a quantitative, cross-sectional research design to examine Activity-Based Costing adoption in Indian agri-business organizations and its effects on cost accuracy and managerial decision-making quality. A cross-sectional approach is appropriate as it captures prevailing costing practices and managerial perceptions at a specific point in time, aligning with the study's objective of analysing relationships among constructs rather than long-term causal dynamics (Creswell & Creswell, 2018).

The study follows a pan-India approach, covering

agri-business firms, Farmer Producer Organisations, cooperatives, and agri-processing units operating across multiple Indian states. Data were collected between November and December 2025 from accounting professionals, finance managers, and senior managers involved in costing, budgeting, and financial decisions.

Primary data were collected using a structured questionnaire adapted from established management accounting literature and contextualised to the agri-business environment (Drury, 2018; Bhimani et al., 2019). All items were measured on a five-point Likert scale. A total of 202 valid responses were analysed.

Results

1. Profile of Respondents

Table 1 presents the demographic profile of respondents. The sample consists of accounting professionals, finance managers, senior managers, and cost accountants, ensuring balanced representation of decision-makers involved in costing practices across Indian agri-business organizations.

Table 1: Profile of Respondents

Category	Frequency	Percentage
Accounting Professionals	62	30.7%
Finance Managers	58	28.7%
Senior Managers	46	22.8%
Cost Accountants	36	17.8%
Total	202	100%

2. Descriptive Statistics

Descriptive statistics were used to assess central tendency and dispersion of the study variables. Table 2 indicates high mean scores across all constructs, reflecting favourable perceptions. ABC adoption shows a mean of 4.39 (SD = 0.59), indicating substantial adoption. Cost accuracy records a mean of 4.31 (SD = 0.74). Decision-making quality is highest at 4.53 (SD = 0.49), while organizational support averages 4.23 (SD = 0.73) among surveyed agri-business respondents.

Table 2: Descriptive Statistics of Study Variables

Variable	N	Mean	Standard Deviation
ABC Adoption	202	4.39	0.59
Cost Accuracy	202	4.31	0.74
Decision-Making Quality	202	4.53	0.49
Organizational Support	202	4.23	0.73

3. Reliability Analysis

The internal consistency of the measurement scales was evaluated using Cronbach's alpha. As shown in Table 3, all constructs demonstrate acceptable to strong reliability, exceeding the recommended threshold of 0.70. ABC adoption records an alpha of 0.795, cost accuracy 0.814, and decision-making quality 0.754. Organizational support exhibits the highest reliability at 0.844. These results confirm that the measurement instruments are reliable and suitable for subsequent statistical analysis.

Table 3: Reliability Statistics

Construct	Number of Items	Cronbach's Alpha
ABC Adoption	5	0.795
Cost Accuracy	5	0.814
Decision-Making Quality	5	0.754
Organizational Support	4	0.844

4. Correlation Analysis

Pearson correlation analysis was conducted to examine relationships among the study variables. As shown in Table 4, significant associations emerge. ABC adoption is positively correlated with cost accuracy ($r = 0.767$, $p < 0.01$), indicating that ABC use is associated with more accurate cost information. ABC adoption also shows a moderate correlation with managerial decision-making quality ($r = 0.545$, $p < 0.01$). Cost accuracy demonstrates a strong relationship with decision-making quality ($r = 0.680$, $p < 0.01$). Organizational support is positively related to cost accuracy ($r = 0.296$, $p < 0.01$) and decision quality ($r = 0.637$, $p < 0.01$).

Table 4: Pearson Correlation Matrix

Variable	ABC Adoption	Cost Accuracy	Decision-Making Quality
ABC Adoption	1		
Cost Accuracy	0.767**	1	
Decision-Making Quality	0.545**	0.680**	1
Organizational Support	0.065	0.296**	0.637**

Note: $p < 0.01$ (two-tailed)

5. Regression Analysis: Impact of ABC Adoption on Cost Accuracy

To examine the impact of Activity-Based Costing

adoption on cost accuracy (Objective 2), simple linear regression was conducted with cost accuracy as the dependent variable and ABC adoption as the predictor, as reported in Table 5. The model is statistically significant ($F = 285.234$, $p < 0.001$) and explains 58.8 percent of the variance in cost accuracy ($R^2 = 0.588$). The standardized regression coefficient is positive and significant ($\beta = 0.767$, $p < 0.001$), indicating that higher levels of ABC adoption lead to significantly improved cost accuracy in agri-business organizations.

Table 5: Regression Results – ABC Adoption and Cost Accuracy

Predictor	Standardized β	t-value	Sig.
ABC Adoption	0.767	16.889	0.000
Constant	—	0.466	0.642

Model Statistics: $R = 0.767$, $R^2 = 0.588$, Adjusted $R^2 = 0.586$, $F = 285.234$, $p < 0.001$

6. Regression Analysis: Impact of Cost Accuracy on Decision-Making Quality

To address Objective 3, a regression analysis examined the effect of cost accuracy on managerial decision-making quality, as reported in Table 6. The model is statistically significant ($F = 171.623$, $p < 0.001$) and explains 46.2 percent of variance ($R^2 = 0.462$). Cost accuracy exerts a strong positive effect on decision-making quality ($\beta = 0.680$, $p < 0.001$), confirming its importance.

Table 6: Regression Results – Cost Accuracy and Decision-Making Quality

Predictor	Standardized β	t-value	Sig.
Cost Accuracy	0.680	13.100	0.000
Constant	—	17.058	0.000

Model Statistics: $R = 0.680$, $R^2 = 0.462$, Adjusted $R^2 = 0.459$, $F = 171.623$, $p < 0.001$

Discussion

The findings provide strong empirical evidence on the role of Activity-Based Costing in enhancing cost accuracy and managerial decision-making within Indian agri-business organizations. Regression results show that ABC adoption significantly improves cost accuracy, explaining nearly 59 percent of its variation, highlighting the effectiveness of ABC in addressing limitations of traditional costing systems in activity-intensive environments. Further, cost accuracy is found to play a critical role in improving managerial decision-making quality by supporting pricing, budgeting, and resource allocation decisions. Together, these results establish a clear empirical pathway linking ABC adoption to improved decision-making through enhanced cost accuracy, extending prior management accounting evidence to the underexplored agri-business context.

Conclusion and Implications

This study demonstrates that Activity-Based Costing adoption significantly enhances cost accuracy and, consequently, managerial decision-making quality in Indian agri-business organizations. Using primary data and regression analysis, the study provides defensible evidence supporting advanced costing systems in complex environments. Managerially, ABC enables improved pricing, budgeting, and strategic decisions. Professionally, the findings highlight the strategic role of management accountants. The study is limited by perceptual data and direct relationships; future research may employ longitudinal designs or mediation models with larger empirical samples. MA

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Book Review

Name of the Book	**GST on Healthcare Industry**
Author	**CMA Sankar Majumdar** Practicing Cost Accountant Guwahati
Published by	Taxmann
Price	₹795/- (464 Pages)

Introduction

In deed an exciting time for me to review a book authored by a learned and experienced Cost Accountant, having vast experience and good command over commercial transactions in Industry. Healthcare industry is growing not only in India but world over with double digit growth. Beauty of any write-up, article or a book is to explain the topic covered, in simple and easy language to analyze pros-and-cons in the context of current socio-economic system and the way forward. In said book the author has explained the concept of Goods and Service Tax (GST) and its impact on healthcare industry vis-à-vis society at large in very systematic manner. He has talked about healthcare sector in pre-and-post GST regime.

Analysis

Author has covered all major aspects of the Healthcare Industry in India. The author has mentioned the socio-economic importance of healthcare not only in India but world-wide. By giving facts and figures, he has explained how different nations governments spend in healthcare sector and how people of the respective countries got benefited from the government initiatives. The author also talked about way forward as many sections of the society are still deprived of fundamental medical facilities. In his book, CMA Majumdar has compared medical expenses being incurred by patients in India and other developed economies and how India can be a pioneer in medical tourism. India ranks in top ten destinations of medical tourism in world. As per one estimate medical tourism in India will be $13 billion by the end of 2026 as cost of medical treatment is almost one-tenth of other developed economies.

Most of the medical facilities under GST Laws are exempted from GST taxes but author has raised a valid question whether such facilities are exempted in real term? Though indoor medical treatment by hospitals, doctor's consultancy and clinical laboratory facilities are kept out of GST but all inputs, input services and capital items being used to render such services are taxable and the same are being recovered from patients only. No doubt in GST:02 reforms, government has taken good initiatives but these are still not sufficient to serve the society in a better way.

The author has mentioned that medical treatment exemptions under GST, seems to be a myth.

Book has also discussed about role of private sector in healthcare sector in India. As government spend less than two-percent of GDP through its numerous health schemes, participation of private and co-operative sector becomes necessary. Business model of private sector in India is no doubt of international standards having good potential for tax collections but at the same time it has exploited the common man of the country too, which needs immediate attention of policy makers. Author has quoted Hon'ble Allahabad High Court case where in, court has made a strong observation that **private hospitals treat patients as ATMs.**

The book also narrates challenges being faced by healthcare sector under GST and under socio-economic environment of India. Medical Insurance is not a favorite subject matter of majority of people in the country. Though in GST:02 reforms, government has reduced GST taxes on health insurance policies but on other side Income Tax Act in recent past has disallowed the benefits of premium being paid for Medial Insurance policies.

Spread over fourteen chapters, the book has discussed almost every aspect of economics of healthcare industry and impact of GST on each and every transaction undertaken. The book carries almost all provisions of GST which impact health sector such as taxability of the services, exempted services, clinical laboratory diagnostic services being provided, registration under GST, documents and records to be maintained, periodical returns to be filed, Input Tax Credits (ITC) available, composite supplies, taxability of pharma products, taxability of hospital canteens, room rent charged to patients, lease agreements for premises, 3rd party agreements, job works, ambulance services, attendant expenses being charged, cash less facility provided etc.

As a whole, book is an encyclopedia on impact of GST on healthcare sector. It also carries numerous case laws and verdicts pronounced by various courts in the country which provide a proper insight to the industry and other stake holders.

Critique

Although book has covered all major aspects of healthcare industry but we know that if any business entity obtains GST number, all provisions of GST laws are applicable in-toto. So, provisions pertaining to Audits under GST, Assessment u/s 61, Notices u/s 73 & 74 for non-compliance of GST provisions, penalties u/s 122, prosecution u/s 132, e-way bills applicability on API, pharma and medical equipment trade and industry, refunds u/s 54, TDS provisions as applicable to government and public sector hospitals/ institutions could have been discussed.

No doubt, India is one of the largest exporters of Bulk drugs/API but at the same time, India is big importer of medical equipment and life-saving drugs. Therefore, provisions of GST impact on import of such goods and services could also be covered.

Also under GST, many transactions such as renting of property, security services, legal services, services of a director in corporate sector, services of Goods Transport Agencies and services by various government departments are covered under Reverse Charge Mechanism (RCM) have further scope for elaboration in the book.

Conclusion

Book carries complete guidance for the entities operating in healthcare sector and gives comprehensive view for the industry. Entities covered under GST laws or newly established units or are in process of establishment, can refer this book so that they may have smooth sailing as for as GST provisions are concerned. Book is also useful for government officials working in CGST/SGST departments, Income Tax Department of Ministry of Finance, Professionals like CMAs, CAs, Advocates who deals in indirect taxes and persons in academia.

As we all know that GST is being amended on frequent basis, so readers are suggested to refer latest notifications, circulars and instructions being issued by the government from time to time while referring any book/article/write-up. MA

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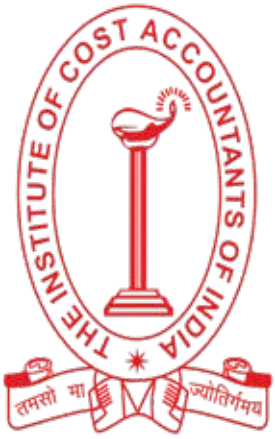

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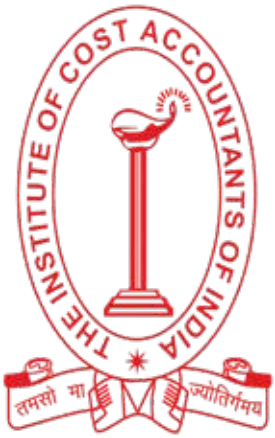

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Interview

CMA LVS Sudhakar Babu

Managing Director
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CMA LVS Sudhakar Babu joined SMFCL as Managing Director on 6th November 2025. He is having over 32 years of experience in the Non-Banking Financial Company (NBFC) sector, having previously served as Executive Director at HUDCO, possessing dual qualifications-MBA and CMA (Cost Management Accounting). He Joined in HUDCO, an NBFC (IFC) and a Navaratna CPSU on 19th January 1994 as a Management Trainee and has grown along with the organisation, working at various levels.

He worked as a State head for Andhra Pradesh, Telangana, Madhya Pradesh & Delhi-NCR. Major contributions to HUDCO, as a State head for the states of Andhra Pradesh and Telangana, disbursed around 15,000 crores for each state during his tenure and contributed significantly to the PAN INDIA operations of HUDCO with highest yield loan portfolios. He also looked after Resource Mobilisation, banking and Investments, Bonds and Special Projects, Business generation, Monitoring. Lending. Financial Concurrence, Corporate Finance, Accounting, Recovery, Fund mobilisation and to economise the cost etc. Additionally, he is having extensive experience and familiarity with NBFC operations, as well as with the regulatory/ compliance framework of the Reserve Bank of India.

Q1. In the context of rising project costs and capital constraints, what key financial and cost-management strategies is SMFCL adopting to ensure sustainable infrastructure financing? How are CMAs contributing to these initiatives?

Ans. In the context of rising project costs and capital constraints, SMFCL is adopting a combination of prudent financial planning and robust cost-management strategies to ensure sustainable infrastructure financing. Key measures include prioritisation and phased execution of projects to align cash flows with funding availability, optimisation of capital structure through a balanced mix of internal accruals and long-term borrowings, and proactive engagement with lenders for favourable financing terms. SMFCL is also strengthening cost controls through value engineering, tighter contract management, and competitive procurement practices to mitigate cost escalations. In parallel, enhanced financial monitoring, improved working capital management, and focus on revenue-generating and economically viable projects are being pursued to maintain financial sustainability and long-term viability.

CMAs play a key role in strengthening budgeting, variance analysis, and cost control mechanisms, enabling timely identification of cost overruns and corrective actions. Through working-capital optimisation, contract cost analysis, and performance measurement, CMAs help improve financial efficiency.

Q2. As a PSU focused on maritime and port-led development, what specific skills and knowledge areas should ICMAI emphasise to better align CMA graduates with the needs of infrastructure finance institutions like SMFCL?

Ans. ICMAI should emphasise skill development in infrastructure project finance, financial modelling for PPP/EPC projects, and risk assessment of maritime assets. Strong grounding in cost management, tariff and concession frameworks, and cash-flow based lending is essential. Additionally, exposure to contract management, viability gap funding, ESG-linked financing, and monitoring of large capex projects will ensure CMA graduates are industry-ready for institutions like SMFCL.

Q3. How are digital tools, data analytics, or emerging technologies transforming financial appraisal and risk assessment at SMFCL? What steps should CMA students take to stay relevant in this evolving environment?

Ans. Digital tools and data analytics are strengthening SMFCL's financial appraisal and risk-assessment processes by enabling more data-driven, timely, and transparent decision-making. Advanced data analytics supports better evaluation of traffic forecasts, revenue sensitivities, and cost overruns, while early-warning dashboards track key risk indicators during project implementation. Emerging technologies such as automation and AI-enabled analytics are also improving due diligence, portfolio monitoring, and compliance, thereby enhancing the overall quality and speed of infrastructure financing decisions.

Following steps CMA students take to stay relevant:

Build digital and analytical skills: Gain hands-on exposure to Excel-based financial modelling, data analytics tools (Power BI, Tableau), and basics of automation and AI applications in finance.

Q4. Given the long gestation and complex risk profile of maritime infrastructure projects, how does SMFCL manage financial risks across project lifecycles? What role do management accounting tools play in strengthening project governance?

Ans. SMFCL manages financial risks across the lifecycle of maritime infrastructure projects through a structured, multi-layered approach, including:

- Robust appraisal and due diligence covering traffic forecasts, tariff assumptions, concession terms, and sponsor strength to address long-gestation risks.
- Lifecycle-based risk assessment, with differentiated monitoring during construction, stabilization, and operational phases.
- Risk mitigation structures such as phased disbursements, escrow and waterfall mechanisms, DSRA, and appropriate security packages.
- Active monitoring and early-warning systems, including periodic review of covenants, cash

flows, and project milestones.

- Portfolio diversification and co-financing, reducing concentration risk across ports, terminals, and maritime assets.

Management accounting tools play a critical role in strengthening project governance by providing **timely, structured, and decision-oriented information** to management.

Q5. How does cost audit and cost transparency help SMFCL improve accountability and efficiency in fund utilisation? In what ways are cost insights leveraged for strategic decision-making?

Ans. Cost audit and cost transparency help SMFCL strengthen accountability by ensuring that project funds are utilised strictly for approved purposes, with clear visibility over cost build-ups, variances, and inefficiencies across the project lifecycle. Regular cost audits promote compliance, early detection of cost overruns, and benchmarking of project costs, thereby enhancing operational efficiency and financial discipline.

Cost insights generated through structured cost records and variance analysis are leveraged for strategic decision-making such as refining project appraisal assumptions, improving risk-based pricing, prioritising funding to cost-efficient projects, negotiating better contracts, and strengthening monitoring of stressed exposures—ultimately supporting sustainable and value-driven infrastructure financing.

Q6. With increasing focus on sustainability and ESG in infrastructure development, how is SMFCL integrating ESG considerations into its financial evaluation framework? What new responsibilities does this create for CMAs?

Ans. SMFCL's integration of ESG in financial evaluation involves embedding environmental and social risk costs, climate-resilience assessments, and governance compliance into project appraisal, funding decisions, and post-disbursement monitoring. ESG parameters are increasingly aligned with regulatory norms, lender expectations, and long-term value creation, ensuring projects are not only financially viable but also sustainable and socially responsible.

New responsibilities for CMAs include incorporating ESG metrics into cost–benefit analysis, lifecycle costing, and risk-adjusted returns; supporting ESG disclosures and impact reporting; evaluating carbon, resource-efficiency, and social compliance costs; and advising management on trade-offs between financial performance and sustainability objectives, thereby strengthening responsible infrastructure financing.

Q7. Looking ahead, how do you see the role of MD at SMFCL evolving over the next five years? What advanced CMA competencies will be most critical to support SMFCL's long-term vision?

Ans. Looking ahead, the role of the MD at SMFCL is expected to evolve from a traditional leadership position to that of a strategic enabler and ecosystem integrator—driving sustainable infrastructure financing, strengthening governance, leveraging digital finance, and aligning SMFCL with national priorities such as port-led development, ESG compliance, and blended financing models.

To support this long-term vision, advanced CMA competencies will be critical, including strategic management accounting, infrastructure project finance, ESG and sustainability reporting, advanced risk management, data analytics, and regulatory compliance.

Q8. What advice would you give to CMA students aspiring to build a career in infrastructure finance and maritime development? What key qualities do you look for while recruiting young CMAs?

Ans. CMA students aspiring for careers in infrastructure finance and maritime development should build strong fundamentals in project appraisal, cost management, financial modelling, and risk analysis, with a good understanding of PPP frameworks, port economics, and regulatory aspects. Continuous upskilling in data analytics, ESG, and digital finance tools is essential.

While recruiting young CMAs, we look for strong analytical ability, commercial and strategic thinking, integrity, adaptability, and effective communication skills, along with a willingness to learn and contribute to long-gestation infrastructure projects. MA

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The Net-zero Pivot
A MANAGEMENT PUZZLE
in Re-engeeneering Reliance Industries for a Green Century

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Abstract

This article deconstructs the strategic and financial shift of India's largest private sector entity, Reliance Industries Limited (RIL), as it pivots from a fossil-fuel-led "Oil-to-Chemicals" (O2C) giant to a "New Energy" powerhouse. Grounded in the publicly announced ₹75,000 crore ($10 Billion) investment roadmap, the piece explores the "Management Puzzle" of capital allocation, carbon risk mitigation, and the valuation shift from "Gray" to "Green" assets. It proposes specific Management Accounting models, such as the Marginal Abatement Cost (MAC) and Green-WACC, to analyze RIL's journey toward its 2035 Net-Zero target.

Introduction: The Giant's Transition

Reliance Industries Limited (RIL) has long been the bellwether of the Indian economy. Its Jamnagar refinery, the world's largest single-site refining complex, is a marvel of global engineering. However, as global capital markets increasingly penalize carbon-intensive industries and the EU implements the Carbon Border Adjustment Mechanism (CBAM), RIL faces a unique "Management Puzzle": How does a company that generates nearly 60% of its EBITDA from O2C (FY24 data) pivot to a Net-Zero future without destroying shareholder value?

From a Management Accounting perspective, this isn't just a technology shift; it is a total re-calibration of the company's "Cost-Value" DNA.

The Narrative: The Jamnagar Transformation

The 2021 strategic pivot by Chairman Mukesh Ambani marked a transformative shift in Reliance's balance sheet, committing ₹75,000 crore to catalyze a decentralized New Energy vertical. This capital deployment centers on constructing four interconnected Giga Factories, engineered to localize production of high-efficiency photovoltaic modules, advanced green hydrogen electrolyzers, fuel cells, and grid-scale energy storage solutions. By integrating these specific technologies, the conglomerate aims to internalize the entire decarbonization value chain. This roadmap strategically de-risks the entity against future carbon liabilities while repositioning its legacy hydrocarbon infrastructure as a cornerstone for India's emerging sustainable industrial architecture.

The First Fracture: The Capital Allocation Paradox in FY 2023-24, RIL's O2C segment recorded an EBITDA of ₹62,393 crore. This cash cow provides the liquidity required for the New Energy pivot. However, the New Energy segment requires massive upfront CAPEX with long-dated

returns. The "Puzzle" for the CFO's office is clinical: How to justify a ₹75,000 crore investment where the Internal Rate of Return (IRR) is sensitive to nascent technologies, while the O2C business still offers proven margins?

If RIL maintains the status quo, it risks "Stranded Assets", refineries that might become liabilities in a world of $100/ton carbon taxes. If it pivots too fast, it risks a "Liquidity Mismatch." This is the classic "Innovator's Dilemma" on a multi-billion-dollar scale.

The Second Fracture: SEBI's BRSR Core mandates have fundamentally elevated the compliance threshold for Reliance Industries, necessitating "Reasonable Assurance" over multifaceted environmental disclosures. Navigating a carbon footprint spanning millions of CO2e tonnes annually presents a formidable data governance challenge. Robustly tracking Scope 3 emissions necessitates a granular audit trail across a vast, global supply network, forcing a paradigm shift from traditional "Accounting for Rupees" to a scientific "Accounting for Molecules." This structural evolution compels the organization to function as a dual-ledger entity, where molecular flows are tracked with the same fiscal precision as monetary transactions. Consequently, "Carbon Profit", the net mitigation of atmospheric impact, emerges as a metric equal in strategic importance to "Cash Profit." By institutionalizing this bilateral reporting framework, the entity ensures that ecological stewardship is intrinsically woven into financial performance, transforming sustainability from a peripheral disclosure into a core pillar of institutional solvency and long-term enterprise valuation.

Analysis: Deconstructing the RIL Green Strategy

The analytical deconstruction reveals three systemic tensions:

1. The Valuation Multiplier Shift

The valuation disparity between legacy hydrocarbon assets and clean-tech entities presents a significant opportunity for "Multiple Arbitrage." Historically, O2C segments trade at conservative 6x-8x EV/EBITDA multiples, reflecting cyclicality and carbon risk. Conversely, green-energy firms attract 15x-25x premiums, driven by ESG-aligned capital flows. By deploying ₹75,000 crore into a New Energy ecosystem, RIL strategically repositions itself to capture these higher valuation tiers. This pivot seeks to decouple the enterprise from fossil-fuel-related discounts, effectively lowering the cost of equity. Consequently, re-branding serves as a financial catalyst, unlocking shareholder value by transforming perceived carbon liabilities into high-growth, technology-driven assets.

2. Target Costing for Green Hydrogen

RIL's $1/kg green hydrogen objective exemplifies a masterclass in target costing, shifting focus from historical recording to aggressive cost-engineering. Achieving this aggressive benchmark necessitates a systemic reduction in renewable energy procurement to below ₹2 per unit, alongside a 60% contraction in electrolyzer capital expenditure. Within this framework, Management Accountants act as strategic architects, institutionalizing stringent "cost ceilings" that mandate radical technological breakthroughs. This reverse-engineered financial discipline compels cross-functional teams to optimize every industrial variable, ensuring that innovation is not merely aspirational but a fiscal prerequisite for global market leadership in the emerging carbon-neutral economy.

Table 1: Strategic Cost Benchmarks for Green Hydrogen Leadership

Cost Driver	Current Industry Average	RIL Target Benchmark	Management Accounting Tool
Renewable Power	₹3.50 - ₹4.50 / unit	**< ₹2.00 / unit**	Experience Curve Costing
Electrolyzer CAPEX	High / Imported	**60% Reduction**	Vertical Integration / Kaizen
Final Product Cost	$3.00 - $5.00 / kg	**$1.00 / kg**	Target Costing
Valuation Multiple	6x - 8x (O2C)	**15x - 25x (New Energy)**	Multiple Arbitrage

3. Vertical Integration as a Risk Buffer

RIL's strategic replication of its O2C blueprint in the New Energy sector centers on comprehensive vertical integration. By internalizing the manufacturing of glass, wafers, and cells, the conglomerate captures midstream margins while insulating operations from global commodity price swings. This structural autonomy transforms external geopolitical dependencies into internal logistical certainties. Management Accountants facilitate this by applying strategic cost frameworks that prioritize self-reliance over outsourcing. Consequently, RIL mitigates "Volatility Risk" and ensures supply chain resilience, proving that total ownership of the production value chain is an effective hedge against fractured global trade and inflationary pressures.

Resolution Models for the Strategic Accountant

Following the "Applied Insight" methodology, we propose four models to manage this transition:

Model 1: The Marginal Abatement Cost Curve (MACC)

RIL must use a MACC framework to prioritize green investments.

- *The Model:* The Marginal Abatement Cost Curve (MACC) serves as a vital decision-support tool, enabling managers to rank decarbonization initiatives by fiscal efficiency. When contrasting a refinery boiler upgrade at ₹2,000 per ton of CO2 mitigated against green hydrogen at ₹8,000, the framework mandates prioritizing the lower-cost intervention. This logical sequencing optimizes capital allocation, ensuring the "Least-Cost Path" to Net-Zero. By systematically targeting the most economical abatement opportunities first, RIL maintains financial liquidity while making consistent, evidence-based progress toward its 2035 sustainability targets.

Model 2: The Green-Adjusted WACC (G-WACC)

Traditional WACC does not account for climate risk. We propose a G-WACC where the cost of debt is lowered by the "ESG Alpha."

- *Data Point:* Reliance's successful acquisition of billions through "Green and Sustainability-Linked Loans" demonstrates a strategic alignment between environmental targets and financial optimization. These instruments often provide a 50-100 basis point pricing advantage over conventional debt, reflecting lower risk profiles perceived by ESG-conscious lenders. By securing cheaper capital, RIL directly enhances the Net Present Value of its decarbonization initiatives. This fiscal arbitrage effectively lowers the hurdle rate for green projects, accelerating the transition toward a sustainable energy architecture.

Model 3: Internal Carbon Pricing (ICP) as a Discipline

RIL can implement a "Shadow Carbon Price" (e.g., $40/ton) across all business units.

- *The Impact:* Internal Carbon Pricing (ICP) institutionalizes environmental accountability by embedding a shadow fee into localized financial reports. When the Jamnagar plant manager is "charged" for every emitted metric ton, climate targets instantly morph from abstract corporate pledges into tangible variable costs. This decentralized fiscal pressure mandates operational optimization at the source, forcing shop-floor innovations that reduce energy intensity. Consequently, emissions management becomes a daily performance metric, ensuring that decarbonization is driven by granular economic incentives rather than top-down mandates.

Model 4: Value-at-Risk (VaR) for Stranded Assets

Calculating "Carbon Value-at-Risk" (VaR) allows Management Accountants to quantify potential balance sheet erosion if a global $100/tonne carbon tax materializes. This prospective modeling exposes the financial vulnerability of high-emission assets to impending regulatory shifts. By presenting these findings, the Board recognizes that the ₹75,000 crore New Energy commitment is not merely an expense, but a strategic "Insurance Premium." This proactive capital deployment hedges against

Source: *https://www.financialexpress.com/business/news-reliance-industries-consolidates-green-energy-business-merges-16-step-down-companies-into-reliance-new-energy-4116950/*

future asset obsolescence and stranded-cost write-downs. Consequently, the investment transforms from a discretionary outlay into a critical defensive maneuver, ensuring long-term institutional solvency and the preservation of enterprise value amidst a decarbonizing global economy.

Conclusion: The Ultimate Actionable Insight

The strategic pivot of Reliance Industries underscores a fundamental truth for industrial titans: enduring relevance necessitates a radical re-engineering of traditional cost structures. This twenty-first-century management puzzle transcends the binary choice between profitability and environmental stewardship; it reveals that within an increasingly regulated global marketplace, sustainability functions as the solitary bridge to institutional solvency. The transformation shifts the focus from short-term margin maximization to the mitigation of systemic climate liabilities that threaten future cash flows.

For Management Accountants, the RIL case offers a profound professional mandate. We must evolve from being reactive "Historians of Cost," merely documenting expenditures, to becoming proactive "Architects of Value." This transition requires institutionalizing carbon risk as a primary variable within every capital allocation framework. By assigning a fiscal weight to emissions, professionals ensure that current industrial investments do not manifest as tomorrow's stranded-asset write-downs.

Reliance's roadmap signifies more than a portfolio diversification; it represents the construction of a modern "Operating System" for the Indian economy—one where resource circularity and energy autonomy drive competitive advantage. Through vertical integration and target costing, the conglomerate demonstrates how to internalize external risks while capturing the "Green Premium" offered by global capital markets. Ultimately, this narrative serves as a blueprint for leadership, proving that the integration of ecological rigor and financial discipline is essential for preserving enterprise value. By championing this dual-ledger approach, Management Accountants safeguard corporate longevity, ensuring that Indian industry remains a resilient pillar of global sustainable development. MA

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CORPORATE GOVERNANCE AND BOARD CHALLENGES IN THE DIGITAL ERA

Abstract

Corporate governance has evolved through successive regulatory reforms aimed at strengthening board oversight, accountability, and transparency. However, the digital era has fundamentally altered the nature of governance challenges faced by boards. Traditional assumptions that financial, strategic, operational, and compliance risks can be managed independently have collapsed. Instead, risks now converge, amplify, and propagate across domains at unprecedented speed. This article examines how digital technologies, artificial intelligence, cybersecurity, geopolitics, organisational culture, and information overload are reshaping board responsibilities. It argues that governance excellence in the digital era depends less on formal structures and more on boards' collective sense-making capacity, judgment, and continuous stewardship.

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Introduction: The End of Comfortable Assumptions

Corporate governance has been a subject of sustained focus for decades. In India, successive committees appointed by the Government—including the Kumar Mangalam Birla Committee (1999), Naresh Chandra Committee (2002), Narayan Murthy Committee (2003), Dr. J. J. Irani Committee on Company Law (2005), and the Uday Kotak Committee (2017)—have examined governance failures, proposed reforms, and seen many recommendations translated into regulation and practice.

Yet, despite this progress, governance today faces a more fundamental challenge. For much of the last century, governance evolved around a reassuring assumption: that financial, strategic, operational, and compliance risks could be understood, overseen, and mitigated as largely separate categories. Boards reflected this thinking through committee structures, reporting lines, and assurance frameworks. That architecture has quietly collapsed.

In today's business environment, risks no longer respect boundaries. They bleed into one another, amplifying and accelerating across domains in ways that challenge even the most experienced directors. A cyber incident rapidly becomes a reputational crisis. Mandatory disclosure to stock exchanges magnifies reputational damage, while media amplification erodes trust. AI-driven decisions simultaneously raise regulatory, ethical, and brand concerns. Cultural weaknesses surface as financial

underperformance or compliance failures. Many boards sense this convergence intuitively—long before they have the language or tools to describe it.

From Siloed Oversight to a Digital Risk System

Until recently, artificial intelligence, data governance, and cybersecurity were treated as discrete oversight topics. That framing is no longer tenable.

These domains have converged into a single **digital risk system,** woven through strategy, operations, culture, reputation, and regulatory exposure.

Artificial intelligence is increasingly reshaping risk management itself—altering not only how risks are identified and monitored, but how decisions are made. Global surveys of risk leaders consistently identify data quality as the foundational requirement for unlocking AI's potential.

Without reliable, high-quality data, AI systems generate outputs that may appear precise but are fundamentally misleading.

Boards do not need to understand how AI works at a technical level. They do, however, need to understand what AI changes:

- Decision velocity and delegation
- The scale and speed at which errors propagate
- Accountability for outcomes driven by opaque models
- Assumptions underpinning control, assurance, and audit

Illustrative Examples

Example 1: Cyber Risk Propagation

A ransomware attack on a company's customer database may initially appear as an IT incident, but its impact quickly cascades across the enterprise. Operations can be disrupted as systems are taken offline, regulatory exposure arises under data protection laws, and reputational damage erodes customer trust and market value. For the board, this illustrates that cyber risk is not merely a technology issue but a strategic and governance concern requiring oversight of risk preparedness, incident response capability, and management accountability across functions.

Example 2: AI Governance and Ethical Risk

The deployment of AI-driven decision systems in areas such as credit scoring, hiring, or customer profiling can create significant governance challenges if not properly supervised. An algorithm trained on biased or incomplete data may lead to discriminatory outcomes, triggering regulatory scrutiny, legal liability, and loss of stakeholder confidence. This underscores the board's responsibility to oversee AI governance frameworks, including data integrity, ethical use, transparency, and alignment with evolving regulatory expectations, rather than delegating these risks solely to management or technical teams.

Digital risk is no longer episodic or containable. It is continuous, systemic, and strategic. Regulators are already signalling this shift through AI accountability regimes, data protection laws, and cyber-resilience expectations (OECD, 2019; EU Artificial Intelligence Act, 2024).

Geopolitics Moves into the Boardroom

Geopolitics is no longer an external backdrop. It directly shapes supply chains, talent mobility, regulatory environments, capital flows, and brand perception.

Boards increasingly find that strategies approved eighteen months earlier feel outdated as geopolitical conditions evolve far faster than traditional planning cycles allow.

Boards do not need to become geopolitical experts. They need a **geopolitical posture**—a structured way to scan, interpret, and integrate geopolitical signals into strategic judgment. This includes:

- Understanding exposure concentrations
- Stress-testing assumptions about markets and suppliers
- Recognising second- and third-order effects of geopolitical shocks

In practice, this requires moving beyond static scenario planning toward continuous strategic sense-making (World Economic Forum, 2023).

Culture and Leadership as Determinants of Resilience

Culture and leadership are no longer "soft" issues

delegated to human resources. They are central to enterprise resilience and therefore core governance responsibilities.

Failure to recognise this exposes boards to interconnected risks:

- Financial underperformance rooted in misalignment, incentive distortion, or leadership fatigue
- Operational risk in high-dependency areas such as cybersecurity, safety, and risk management
- Compliance failures where overloaded teams fail to escalate early warning signals
- Board fatigue itself, challenge quality and decision discipline
- Reputational damage, as cultural failures increasingly prompt scrutiny of board oversight

High-profile corporate failures over the past decade consistently demonstrate that cultural warning signs were visible long before outcomes crystallised (Financial Reporting Council, 2018).

Information Abundance and Interpretation Scarcity

Modern boards rarely suffer from lack of information. The more acute challenge is distinguishing signal from noise and achieving shared interpretation.

Information overload creates a new class of governance risk:

- Strategic delay as uncertainty paralyses decision-making
- Blind spots across interconnected risks
- Dysfunctional group dynamics, including deference, groupthink, or silence
- Reputational exposure when crises reveal that boards had information but lacked collective understanding

Governance Insight: From Data Overload to Decisive Oversight

- **Issue:** Boards receive extensive dashboards but lack early-warning signals.
- **Illustration:** Cyber reports show 99.9% uptime yet omit metrics such as incident detection time or third-party risk exposure.
- **Regulatory Context (India):** SEBI and RBI increasingly expect boards to focus on key risk indicators rather than the volume of reporting.
- **AI Oversight Practice:** Board-approved AI governance frameworks incorporating bias testing, explainability reviews, and Digital Personal Data Protection Act compliance.
- **Outcome:** In several cases, boards have paused or redesigned AI systems after identifying unfair or opaque outcomes, thereby preventing regulatory and reputational fallout.

The core issue is not data availability but **sense-making capacity**—the board's ability to integrate fragmented insights into coherent judgment.

The Rise of Personal Accountability

Personal liability, investor activism, and reputational exposure have decisively shifted from the organisation to the individual director.

Regulatory actions, public inquiries, and shareholder scrutiny increasingly focus on what boards knew, how they challenged management, and whether oversight was credible.

This fundamentally alters board dynamics. The most material governance risk today is not management capability alone but the board's own capacity, capability, and coherence.

The critical governance question therefore becomes:

Is the board a strategic asset—or merely a passive reviewer of management outputs?

From Episodic Oversight to Continuous Stewardship

In the digital era, governance must evolve:

- From episodic oversight to continuous value creation
- From static agendas to dynamic sense-making
- From rear-view compliance to forward-leaning stewardship

Digital velocity, data abundance, and systemic interdependencies require boards to anticipate emerging risks and opportunities, integrate real-time insights, and actively shape long-term value—not merely assure past performance (McKinsey &

Company, 2022).

Evolving Board Structures and Practices

Effective boards embed digital oversight into core governance processes rather than treating it as an add-on.

1. Restructuring Board Agendas and Processes

- Rebalancing agendas toward forward-looking strategy
- Allocating explicit time to digital, AI, regulatory, and transformation risks
- Using secure digital portals, real-time dashboards, and collaboration tools to enhance decision quality

2. Monitoring Governance Effectiveness

- Tracking indicators such as time spent on strategy, digital maturity, innovation outcomes, and transformation-linked risks
- Conducting annual board and committee evaluations
- Introducing term limits and structured refreshment to sustain cognitive diversity
- Commissioning periodic governance and capability audits

These mechanisms must be embedded meaningfully—not as compliance rituals, but as foundations for reflection, course correction, and renewal.

The Central Governance Challenge

The solution to modern governance challenges is not more committees, frameworks, or compliance layers.

The central challenge lies in strengthening the conditions under which directors can:

- Make sense of uncertainty
- Test management's assumptions
- Engage in high-quality, constructive challenge
- Converge on coherent, value-creating decisions

In the digital era, governance excellence is defined less by formal structure and more by judgment, discipline, and collective intelligence at the board table. MA

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Congratulations!!!

CMA Delzad Dinyar Tanaz Jivaasha

Heartiest Congratulations to CMA Delzad Dinyar Tanaz Jivaasha, Member of the Institute, being bestowed the prestigious honour of CFO Next 100, 2025 for the 5th year in a row. The awards were instituted to recognize the leadership, best practices implementation and path breaking innovation by individuals. His leadership and consistent efforts to cement the importance and build a culture of Risk Management, Compliance and Governance has been appreciated with him being recognized as a leader in that space.

CMA Delzad Dinyar Tanaz Jivaasha was also declared a winner in the Risk Management & Compliance category at the Aspiring CXO Awards, 2025 for his conceptualization and implementation of best practices in core areas of importance, in the space of Risk Management, Compliance and Governance.

We wish CMA Delzad Dinyar Tanaz Jivaasha the very best for all his future endeavours.

IBC IN ACTION: FIELD REFLECTIONS AND FUTURE REFORMS

Abstract

The Insolvency and Bankruptcy Code (IBC), enacted in 2016, revolutionised India's insolvency framework by introducing a time-bound, creditor-centric corporate insolvency resolution process (CIRP). This study systematically evaluates the effectiveness of the IBC from 2016 to 2024, focusing on resolution timelines, creditor recovery, and stakeholder outcomes. A mixed-methods approach was employed, combining quantitative analysis of data from the National Company Law Tribunal (NCLT) and the Insolvency and Bankruptcy Board of India (IBBI) with qualitative insights from stakeholders' interviews and case reviews. The quantitative findings indicated significant improvements in the recovery rates and process efficiency. However, qualitative analysis reveals three key implementation challenges: judicial delays at the NCLT and the National Company Law Appellate Tribunal (NCLAT), limited institutional capacity, and procedural complexities, particularly in complex corporate cases and valuation disputes. While the IBC's legislative framework is robust, its full potential depends on addressing institutional and operational constraints. This study proposes evidence-based recommendations to strengthen the IBC's implementation, enabling it to serve as an efficient, globally competitive insolvency resolution system that supports sustainable economic recovery.

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Introduction

India's Insolvency and Bankruptcy Code (IBC), enacted in 2016, represents a paradigm shift in the country's insolvency framework, replacing fragmented and protracted mechanisms for managing financial distress (Agnihotri, 2023). The Code introduced a time-bound, creditor-driven resolution process designed to maximise asset value, encourage entrepreneurship, and maintain a balance of equitable stakeholder interests. Central to this framework is the Corporate Insolvency Resolution Process (CIRP), which transfers control from distressed promoters to licensed insolvency professionals and is supported by dedicated institutions, including the Insolvency and Bankruptcy Board of India (IBBI), Information Utilities, and the National Company Law Tribunal (NCLT) (Morrissey et al., 2025).

A literature review revealed a critical gap. On the one hand, substantial attention has been devoted to the IBC's structural design and institutional architecture. However, empirical assessment of its practical effectiveness, that is, its actual ability to achieve the stated objectives in implementation, remains limited. The distinction between legislative intent and real-world outcomes is fundamental to understanding insolvency reform. An effective insolvency law must demonstrate clarity in drafting, enforceability, institutional capacity, and timeliness in decision-making. It must align with stakeholder needs and broader socioeconomic objectives. Despite the IBC's stated objectives, empirical evidence documenting its performance across diverse insolvency categories, geographic contexts, and temporal phases remains scattered and incomplete, limiting a comprehensive assessment of its multidimensional effectiveness.

This study addresses this research gap by systematically evaluating IBC effectiveness and examining the extent to which the Code translates its statutory objectives into measurable outcomes. Specifically, we investigated the following questions:

- Adherence to prescribed timelines in the CIRP resolution
- Institutional capacity and decision-making process
- Economic impact on asset recovery and creditor protection.

By bridging the gap between legislative design and implementation outcomes, this study contributes to the understanding of what distinguishes effective insolvency reform from well-intentioned policy frameworks, offering insights relevant to India's ongoing refinement of insolvency laws and to emerging economies undertaking similar reforms.

Research Problem

Primary Problem: Despite being enacted in 2016 and establishing a comprehensive institutional framework, the IBC lacks empirical evidence of its practical effectiveness in achieving its stated objectives. Although the law's structural design is well documented, a critical gap exists between legislative intent and actual implementation outcomes.

Despite years of implementation, the effectiveness of the IBC in practice remains unknown. The current literature focuses on the law itself but provides no empirical evidence on whether it effectively achieves its stated objectives. However, it remains unclear whether the IBC achieves its core objectives (maximising asset value, encouraging entrepreneurship, and stakeholder equity) in practice.

Research Methodology

This study employs a mixed-methods approach, combining quantitative and qualitative analyses to comprehensively evaluate the effectiveness of IBC implementation. The quantitative component uses secondary data from NCLT records, IBBI statistics, and publicly available case databases to assess resolution timelines, recovery rates, and resolution success metrics across the CIRP cases filed between 2016 and 2024. Study was conducted to understand case duration, creditor recovery percentages, and resolution outcomes. Additionally, qualitative case reviews of landmark CIRP decisions and "Dirty Dozen" cases were systematically analysed to identify procedural bottlenecks, challenges to judicial interpretation, and implementation gaps. Document analysis of tribunal orders, regulatory directives, and stakeholder submissions provides contextual evidence of the operational constraints affecting the effectiveness of the CIRP.

The qualitative component incorporated semi-structured interviews with the participants. The total number of respondents was 24, comprising professionals such as Cost Accountants, Chartered Accountants, Company Secretaries, and Advocates who are practising as Insolvency Professionals (IP)/ financial valuers/forensic auditors. This study used a purposive sampling technique. The interviews were designed to capture stakeholder perceptions of IBC effectiveness, institutional capacity limitations, procedural challenges, and recommendations for systemic improvement. Interview transcripts were analysed using inductive thematic analysis to identify convergent and divergent stakeholder perspectives. Qualitative stakeholder insights facilitate a comprehensive assessment of the IBC's actual versus perceived effectiveness.

IBC Implementation experience:

Respondents appreciated the clear procedures and shift of control from the debtor to a neutral professional, which improved transparency. However, they noted practical limitations, particularly delays caused by overburdened tribunals and litigation, which impeded adherence to the prescribed timelines. IPs expressed concerns that judicial bottlenecks undermine timely resolution and erode distressed asset value. Financial valuers noted that standardised valuation guidelines brought discipline to the process but highlighted challenges from incomplete financial information. They indicated that the lack of reliable records affects valuation accuracy, contributing to stakeholder disputes and delayed resolution plans (Banerjee & Kumar, 2023). Corporate creditors view the IBC as a strong recovery tool that improves credit discipline and increases lender bargaining power. However, they were dissatisfied with the actual recoveries, noting significant gaps between claims and recovered amounts in complex cases. They attributed this to systemic delays and applicants' reluctance to engage with companies facing operational uncertainties. Creditors recommend streamlined processes and stronger oversight to improve the outcomes.

Corporate debtors accepted that the threat of insolvency proceedings under the CIRP compelled them to make early payments or seek restructuring. Many defaulters view the Bankruptcy Code as fair yet strict, ensuring promoter accountability and timely recognition of distress. However, they expressed concerns over procedural inflexibility, particularly the loss of managerial control during the CIRP (Kattadiyil & Islamov, 2021). Some respondents suggested that pre-packaged insolvency or out-of-court settlements could provide better revival opportunities than the CIRP. They noted that the current framework limits promoters' participation in restructuring when a company fails (Thornhill & Amit, 2003). Stakeholders unanimously agreed that institutional capacities, especially within the NCLT, should be strengthened to reduce delays. This is also highlighted in the Dirty Dozen cases referred to in the table below. They advocated for digital interventions to simplify the CIRP by improving case tracking and implementing uniform data submission platforms. Responses suggest educating smaller creditors about their rights under the Code to encourage active participation (Singh, 2021). The interviews revealed that while the Insolvency and Bankruptcy Code (IBC) created a paradigm shift in Indian insolvency (Gupta & Kumar, 2024), its effectiveness was moderated by systemic and procedural factors. Continuous improvement and strengthening of the system at all levels, along with stakeholder engagement, are essential to achieve the Code's goals of timely resolution, value realisation and economic recovery.

IBC Learnings

Engaging stakeholders, including insolvency experts, financial appraisers, creditors, and debtors, provides insights into implementing the Insolvency and Bankruptcy Code (IBC). Discussions often focus on the "Dirty Dozen" cases involving major distressed companies like Essar Steel, Bhushan Steel, and Jaypee Infratech, which were among the first to be processed under the IBC. These cases have become learning experiences for practitioners and policymakers, influencing insolvency frameworks. The Dirty Dozen cases provide a crucial assessment of the Corporate Insolvency Resolution Process (CIRP), revealing procedural flaws, delays, and issues with stakeholder coordination. A key challenge is adhering to timelines within complex corporate structures and lengthy court processes. The respondents also highlighted the valuation disputes. The Dirty Dozen cases demonstrate the need for robust valuation methods and clear documentation. Disagreements over values often delay resolution, suggesting that standardised criteria and the mandatory submission of financial data would be solutions. The IBBI subsequently provided clearer guidance on valuation practices in India. Banks reflected on how these cases exposed the strengths and weaknesses of distressed asset management. While significant recoveries were achieved in cases such as Bhushan Steel, lenders noted that legal disputes often diminish recovery rates. Respondents emphasised the need for a more efficient appeal process and increased staffing at the NCLT and NCLAT to minimise delays.

In situations where companies faced difficulties due to market downturns rather than poor

management, owners suggested improving the system through constructive dialogue instead of exclusion. These discussions highlight the policy challenges in implementing pre-pack insolvency strategies and the opportunities for promoters under stringent regulations. The respondents advocated for clear legislation on complex issues, such as avoiding agreements, managing dissenting creditors, and determining payment priority in Dirty Dozen cases.

The Dirty Dozen cases significantly influenced code amendments by setting precedents. These cases tested the robustness of the insolvency system, demonstrating both the IBC's capacity for change and its real-world implementation challenges. These insights have guided improvements and created a more responsive policy framework for addressing insolvency in India.

Company Name	Timeline	Recovery Trend (Creditor Haircut %)	Stakeholder Response & Outcome
Bhushan Steel Ltd	10 months	~63%	Acquired by Tata Steel for ₹35,200 Cr; 63% creditor recovery; NCLT approval; fraud investigation against Neeraj Singal; plant operations continued; employment secured
Bhushan Power & Steel Ltd	28 months	~59%	JSW Steel acquisition for ₹19,350 Cr; 41% financial creditor recovery; contentious bidding process; NCLAT appeals; operational creditors 95% haircut
Essar Steel India Ltd	28 months	~55%	Largest IBC resolution; ArcelorMittal acquired for ₹42,000 Cr; Supreme Court litigation; Ruia family legal battles; 90% financial creditor recovery; 15,000+ jobs protected
Alok Industries Ltd	23 months	~83%	Reliance Industries/JM Financial consortium for ₹5,050 Cr; 17% creditor recovery; operational creditors severely impacted; business restructured under new management
Monnet Ispat & Energy Ltd	10 months	~76%	JSW Steel acquired for ₹2,875 Cr; 24% creditor recovery; NCLT approval; integrated with JSW operations; workforce retained; production resumed
Electrosteel Steels Ltd	9 months	~60%	First RBI-12 case resolved; Vedanta Ltd acquired for ₹5,320 Cr; 40% recovery; promoter fraud allegations; capacity expansion planned; jobs preserved
Jaypee Infratech Ltd	43 months	~25%	Suraksha Realty acquisition for ₹7,350 Cr; 32,000+ homebuyers affected; multiple NCLT/NCLAT/SC appeals; flat delivery commitments; homebuyer protection prioritized
Lanco Infratech Ltd	30+ months	~90%	First of RBI's list to be referred; resolution attempts failed; ordered into liquidation; minimal creditor recovery; assets under auction; legal disputes ongoing
Amtek Auto Ltd	12 months	~95%	Initial resolution by Liberty House failed; CIRP restarted; ordered into liquidation; piecemeal asset sales; severe creditor losses; promoter legal proceedings

Era Infra Engineering Ltd	36+ months	~85%	Resolution attempts were unsuccessful; moved toward liquidation; limited asset value; creditors facing severe losses; legal complications; minimal recovery expected
ABG Shipyard Ltd	60 months	~98%	Liquidation after failed resolution; India's largest bank fraud case filed; CEO arrested; assets auctioned; minimal creditor recovery; CBI investigation ongoing
Jyoti Structures Ltd	12 months	~92%	No viable resolution plan received; ordered into liquidation; asset sale process; creditors face heavy losses; operational challenges; minimal recovery for stakeholders

Source: The Table is prepared by the authors.

Conclusion

This study offers a systematic empirical assessment of stakeholders' perceptions regarding the practical effectiveness of the Insolvency and Bankruptcy Code (IBC), revealing a complex picture of progress hindered by implementation challenges. Our findings indicate that the IBC has fundamentally reformed India's insolvency landscape, yielding measurable improvements. Efficiency, transparency, and creditor focus are observed compared to previous regimes. However, significant structural and institutional barriers remain in translating legislative intent into consistent outcomes. Our research uniquely quantifies stakeholder consensus on both the achievements and limitations. Insolvency practitioners, financial valuers, corporate creditors, and debtors collectively recognised that the new framework would enhance recovery and improve creditor discipline. This study identifies and documents critical implementation gaps that prior conceptual analyses have overlooked. Valuation disputes and information access barriers emerge as a major systemic constraint. The judicial delays and organisational complexity create operational friction, undermining case resolution timeframes. Importantly, this study transcends subjective accounts to provide structured evidence of performance gaps in the IBC. The experiences of the "Dirty Dozen," analyses, and interviews with respondents reveal that institutional capacity deficits—not legislative design flaws—constitute the primary bottleneck to effective insolvency resolution. However, this distinction has not been systematically documented in the literature.

Implications and Future Directions:

Our findings propose four targeted reforms: enhancing judicial infrastructure and capacity, promoting digital adoption, refining valuation and regulatory procedures, and improving inter-institutional collaboration.

By documenting what works, what fails, and why, this research aims to transform the IBC from a promising policy initiative into a system capable of robust, efficient financial distress resolution. MA

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With best compliments from

The Institute of Cost Accountants of India, Vijayawada Chapter

USE OF INFORMATION TECHNOLOGY IN COST AUDITING: TOOLS, TECHNIQUES AND CHALLENGES

Abstract

Cost auditing, beyond its statutory mandate, offers multifaceted benefits to organizations—strategic, operational, financial, managerial, and decision-making. Unlike financial audits, cost audits delve into granular operational data, uncovering inefficiencies, enhancing resource utilization, and supporting pricing and investment decisions. However, the complexity of cost structures, diverse cost drivers, and lack of standardized formats pose significant challenges. To address these, auditors follow a structured methodology encompassing planning, fieldwork, verification, analysis, and continuous improvement. The integration of Information Technology has revolutionized cost auditing by enabling real-time data access, anomaly detection, and predictive analytics. Tools such as ERP systems, audit analytics software, AI, machine learning, IoT, Power BI, and blockchain enhance accuracy, transparency, and efficiency. Despite these advancements, challenges persist—human judgment remains irreplaceable, cybersecurity threats loom, algorithmic errors can mislead, and continuous training is essential. Moreover, integration hurdles and rapid regulatory changes demand agile IT adaptation. Thus, while technology empowers cost auditors, its effective use requires strategic oversight, domain expertise, and robust governance to ensure audit integrity and organizational value creation.

Other than Statutory requirements, Cost Audit is very beneficial to organization in many ways.

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It is due to Cost Audit dives deep into complicated operational activities. Its findings are different than normal financial and internal audit. Cost Audits vary purpose to support strategic decision making but this is not only benefit of Cost Audit. Various organization find too many benefits as well from Cost Audit. Benefits can be bifurcated into some broad heads like

A. Strategic benefits
B. Operational benefits
C. Financial benefits
D. Decision making benefits
E. Managerial benefits

These benefits cannot be fully described but some details of these benefits are as under :-

A. Strategic benefits

a. Value creation: - Cost audit support any organization to create value through cost rationalization, improvement in margins.

b. Planning support- Cost audit make easy to understand cost behavior and business cycle. These elements help to enhance capacity enhancement, create competitive positioning.

c. Pricing competitiveness- Comparison between different vendors offers

B. Operational benefits

a. Cost Savings-though better material usage along-with its alternatives & combination, labor matrix and their positioning cost audit helps organizations to save cost to manifolds.

b. Enhances resource utilization- utilization of resources in better ways this include improved capacity utilization, identification of unutilized assets. Optimization of input output ratio. Pinpoint of excessive consumption of resources. Reduce excessive inventory which improves working capital management.

c. Better operational efficiency- though improved margins, by analyzing internal performance with industry performance. Cost audit also suggests continuous improvement.

d. Finds the weaken area- through ratio analysis, variance analysis with standard , budgeted data.

C. Financial benefits

a. Increase profitability- removes hidden cost elements

b. Funding and investment decisions- through cost discipline organizations may attract lenders and investors for capital allocation, expansion and restructuring

c. Evaluate the performance- Operational as well as Financial

D. Decision making benefits

a. Provide important information- for price determination, budgeting, tendering, negotiations and future planning

E. Managerial benefits

a. Identification of inefficiencies and cost overruns

b. Improved internal control- highlight weakness

c. Enhance transparency and Governance

All the above we got from the process of Cost Audit which is basically systematic examination of organization records. This examination check completeness, accuracy, efficiency along with statutory compliances. Cost Audit verify various records such as Material consumption history, Labor rate contract, Salary structure, Overheads allocation and absorption analysis, production efficiency, examination of cost statement etc.

But outcome of these gems is required very cumbersome efforts and use of extreme skills. Challenges for cost audits are

1. **Understanding of cost structure and its complexity-**Different and various cost elements- Cost auditor needs to analysis cost elements of Direct cost, cost of Utilities, Overheads-administrative and plant, by products, joint products and complexity of Allocation of costs
2. **Different cost drivers**- Material related drivers, labor impacted drivers, machine driven drivers, all these drivers change really fast and for proper costing required frequent validation.
3. **Different cost auditing standards and different formats of reporting**- In costing there is no uniform costing accounting standard. This is because every product or industry have different cost structure and cost flow.
4. **Lack of standard working in organizations-** Many organizations does not follow standardize working which increase manual intervention.
5. **Deep records scrutiny**- Unlike financial audits cost audit does not only verify ledger balances but it required detailed scrutiny of material consumption, Inventory movement, labor allocation, overhead analysis, production logs verification etc.
6. **Different department co-ordination**- Auditor need to understand working of different departments and requires interactions.

To meet these challenges cost auditor follows normally following procedure

a. **Planning of the audit and preparation for the same-** This is very important phase of any audit as said *"A focused start ensures that no cost element hides in the shadows."*. In this step auditor do many activities like understanding the scope of work. Do risk assessment. Resource allocation works also required to be done in this phase. This phase ends with

b. **Fieldwork -**This phase includes on site walkthrough for cost occurrence and deployment of resources. Also, interaction between departments to understand work flow. Use of IT environment and its tools for scoped work.

c. **Obtain records and verification: -** Collection of records for verification and reconciliation is important phase in cost records audit. Reconciliation between physical records with system records. Reconciliation between financial and costing records.

d. **Analytical review-** Variance analysis, ratio analysis, trend analysis, comparison between actual and standard/budgeted data is part of cost audit. Comparison between inter plants and inter company also provide useful information.

e. **Preparation of the reports: -** This step includes General information, Cost Accounting policy, Observation and suggestions, Quantitative information, Reconciliation statement.

f. **Follow up-** Via this step auditor check that organization has done corrective action, track the recommendation.

g. **Continuous Improvement: -** This is not a step but a process which use findings of audit for betterment in cost accounting practices and internal controls.

As world is going to adopt technology in rapid pace, these technologies not only make transaction accurate but also complicated. It is therefore auditors are also required to adopt technologies to make their job fast and accurate. Question arises that which technology can be used for which purpose.

Following tools and technologies are available to better work, reducing effort and quality improvement.

1. **ERP systems**- which consolidate data, provide audit trail. This tool also provides to check real time transaction auditing. Auditor also verify cost flow real time suggestions. This tool provides tracking of cost among different department and cost center.
2. **Audit Analytics Software**: - This tool provide automatic data sampling, finds anomalies and show cost trends.
3. **Cloud platform**- provide auditors facility to do remote audit and easy collaboration. This provide centralized data access, internal accounts & finance team and auditors can work simultaneously.
4. **Artificial intelligence** – Cost prediction, by using of previous data, report the deviation with actual data and comparison with budget. These tools also provide test audit scenario
5. **Machine learning**-. identification of abnormal transactions. Classification of expenses. By using this tool actual data flow check done which provide comparative data with actual log. Outcome of this provide details of manual intervention, unauthorized access,
6. **ACL**- Audit Command Language or commonly known as Access Control List. This tool or software used by auditors for tracking forgery, malfunctioning and managing risk through irregular data transactions and pattern in data.
7. **Data Visualization platforms** like Power Business Intelligence commonly known as Power bi which provide detailed insight of data through interactive screens which make decision making comparatively easy.
8. **IoT**- Internet of Things this technology connects through network of objects without any human intervention. These devices do work continuously to gather various data, which enable continuous monitoring by auditor. This reduces risks, Do automated checks.
9. **XBRL reporting tools**- These tools convert

data into MCA prescribed taxonomy formats. Some tools provide validation and backup facility.

10. **Document management and workflow automation**- This tool does scan, classification, automation, combines notes, database.
11. **Blockchain-** enhances transparency and ensure immutable records of accounting and audit. Its benefit is that entries once recorded cannot be altered. This technology helps to do continuous audit with time stamped data. This help detect unauthorized modification, duplicate entries, inflated costs.

Use of tools and techniques makes work comparatively easier than ever before but Challenges of use of information technology in use of costing also exist.

1. **Human intelligence required**- Technology can provide data, pre-defined analysis etc there will always be space for human intelligence. Because this is essential for deeper thinking, new creation, Innovation, adaptability where uncertainty exist, decision making after evaluation all the necessary factors.
2. **Cybersecurity**- this is one of the biggest challenges in the field of auditing while using information technology as a tool. Cyber-attack can tamper data and integrity of audit evidence.
3. **Wrong algorithms used in**- This is very risky circumstance. In this situation firstly very difficult to identify the problem. Secondly this situation can show very misleading results, overlook fraudulent transactions and flag legitimate transactions. These also can produce biased results. By wrong algorithms transparency can also be compromised.
4. **Training requirement**- As IT environment vary fast pace in nature. It continuously and constantly keeps changing. New tools, framework and language continuously emerging.
5. **Integration requirements**: - For better audit results, hassle-free integration between different system is required. In absence of those results in delay in reconciliations, complexity in audit trails, creates internal control testing. Many times over customization of any standard software create obstacles for upgradation of software.
6. **Complex requirements**: - Business and statutory requirements changes rapidly. In IT environment change management is always difficult to adopt and to get correct results. Every time to meet change requirement in it environment is not trivial. After frequent change exhaustive testing and validation is required. MA

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Celebration of Maa Saraswati Puja at the Institute Offices

EVALUATION OF EXTENDED ONE-SHIFT THERMAL POWER PLANT OPERATIONS WITH BATTERY ENERGY STORAGE: IMPLICATIONS FOR COST OPTIMIZATION, EMISSIONS, AND GRID RELIABILITY IN INDIA

Abstract

In India, renewable energy is getting integrated into power generation rapidly which is incurring operational stress on coal-based thermal power plants. Power plant units designed for base-load operation are forced to provide flexibility, leading to frequent load ramps, inefficient part-loads and high maintenance costs. The present paper evaluates techno-economic and regulatory assessment of integrating a 75 MW/300 MWh BESS with a 500 MW thermal unit operating under an extended one-shift regime. The thermal unit maintains stable output during solar peak hours (11:00 AM–3:00 PM), with surplus energy stored and discharged during evening peak (7:00 PM–11:00 PM). The study evaluates the impact on operating costs, emissions intensity, and system reliability by taking CERC, CEA and NITI Aayog normative parameters into consideration. The result shows that despite high upfront costs, thermal-integrated BESS can generate value through arbitrage, reduced cycling losses, improved heat rate, and ancillary services.This Paper also discusses pathway for regulatory treatment within existing Indian market frameworks.

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1. Introduction

In India the power sector is getting transformed due to rise in demand, increase in VRE penetration and market-based dispatch. Coal plant's efficiency is getting degraded due to frequent flexible and below technical minimum operations instead of firm load operations.

2. Indian Power System Context

VRE penetration in India's power sector is reshaping its net-demand and operational

variability. Coal units are now forced to operate flexibly incurring inefficiencies and O&M losses. In this context, the present study reframes BESS for stabilising, flexibility-enabling asset for thermal generation which was earlier framed for only renewables

3. Conceptual Framework: Extended One-Shift Operation with BESS

This model reframes load-following into an extended one-shift regime, maintaining the thermal unit at ≥55% load. The BESS acts as a stabilising buffer, absorbing surplus generation during the 11:00 AM–3:00 PM solar peak (instead of backing down to ~40%) by charging ~75 MW (500 MW unit), and discharging during the 7:00 PM–11:00 PM peak, reducing ramping, cycling, and mechanical stress.

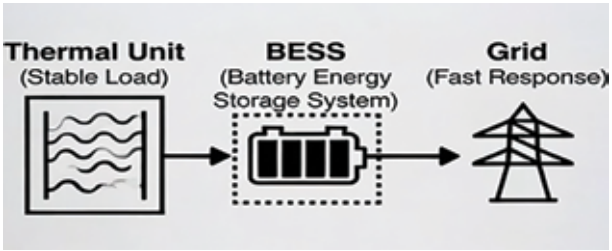

Figure 1. Conceptual schematic of the extended one-shift operating framework with BESS integration. The BESS acts as buffer for thermal unit during solar peak hours.

4. Technical Parameters and Assumptions

Table 1. Key technical and economic assumptions used in the analysis.

Category	Parameter	Value	Basis / Source Type
Plant	Installed capacity	500 MW	Representative unit assumption
Operation	Load during solar peak without BESS	40% of MCR	Scenario assumption
Operation	Stabilized load with BESS	55% of MCR	IEGC (Fourth Amendment), 2016
BESS sizing	Incremental power absorbed	75 MW	Derived (15% of 500 MW)
BESS sizing	Energy capacity	300 MWh	Derived (75 MW × 4 h)
BESS sizing	Power rating	75 MW	Project sizing
Utilization	Cycles per day	1.0	Extended one-shift logic
Efficiency	Round-trip efficiency	90%	Normative benchmark
Losses	Discharge loss	10%	Modeling assumption
Degradation	Annual degradation	2% p.a.	International benchmarks
Life	Design life	15 years	Planning assumption
Cost	Benchmark CAPEX	₹1.5 Cr/MWh	Derived from VGF Tranche -1 ceiling
Support	VGF	₹0.46 Cr/MWh	VGF Tranche -1
Cost	Effective CAPEX after VGF	≈ ₹1.04 Cr/MWh	Derived

Note: VGF Tranche-1 is used to reflect early-stage thermal-integrated BESS deployment, which faces higher uncertainty and limited revenue monetization than mature solar BESS systems.

Parameters follow regulatory benchmarks and transparent assumptions; the BESS is sized to maintain ≥55% MCR during 11:00–3:00, absorbing ~75 MW for 4 hours (300 MWh), with losses explicitly modeled.

5. Techno-Economic Analysis

5.1 Energy Arbitrage

Assumption:

- Analysis of IEX DAM shows consistent intra day price variation ,reflecting higher prices during evening peaks than solar-rich daytime hours,The assumed DAM price spread of ₹3.0/kWh is indicative and conservative, actual spreads vary across regions and seasons.
- A charging price of ₹3.0/kWh and a levelized BESS cost of ₹2.8/kWh are assumed , yielding an effective delivered cost of ₹5.8/kWh and a peak–off-peak spread of ₹3.0/kWh. With 300 MWh daily discharge and 10% losses, usable energy is 270 MWh/day.

Calculation:

Annual arbitrage revenue: 270 MWh × 365 × ₹3/

kWh = ₹29.57 crore/year

Implication: Under the assumed price spread a 300 MWh/day BESS can earn ~₹29.6 crore per year from energy arbitrage.

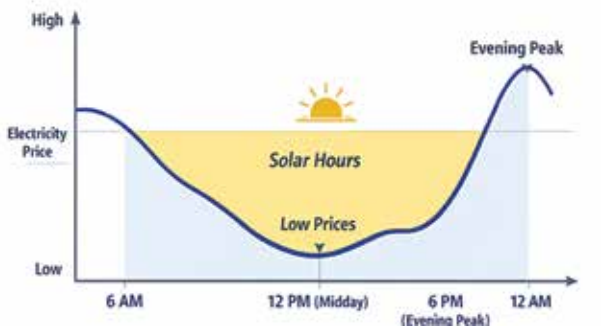

Figure 2. Conceptual intraday electricity price profile under high solar penetration. The figure infers a low prices during solar peak hours and high prices during evening hours.

5.2 Cycling and Wear-and-Tear Savings

Assumption:

- A conservative 5–10% incremental O&M burden is attributed to flexible operations.
- Thermal capacity is considered as 500 MW and BESS can avoid 30–40% of this incremental O&M burden.

Calculation:

- Base Annual O&M cost **:** 500 MW × ₹30 lakh/MW/year = **₹150 crore/year**
- Incremental O&M due to ramping (5–10%): **₹7.5–15 crore/year**
- O&M cost avoided through BESS (30–40%):**₹2.5–6 crore/year**

Implication: Reduced frequent ramps and cyclings through BESS offsets 2.5-6 crore/year in incremental O&M costs for 500 MW power plant (inline with CEA guidelines).

5.3 Heat Rate Improvement

Assumption: A conservative 5–7% heat-rate improvement is assumed ,representing a best-case for older subcritical units operating at deep part load when shifting from 40% to 55% load.

Calculation: For a 500 MW unit operating at 275 MW for 4 h/day

Annual energy= (275MW) x (4h) x 365) days = ~ 402 GWh/year ,

Fuel spend at ₹4/kWh is (402 GWh/year) x (₹4/kWh) = ₹160.8 crore/year,

Savings yield 5-7% of ₹160.8 crore/year = **₹8.0–11.3 crore/year**.

Implication: Avoiding deep part-load operation improves combustion stability, turbine efficiency, and auxiliary power and thereby yielding savings of **₹8.0–11.3 crore/year**.

6. Emission Intensity reduction:

Assumption: In Thermal power plant without BESS, the unit operates at ~40% load during solar peak hours. With BESS under the extended one-shift framework, output is stabilised at ~55% (≈275 MW) for 4 h/day.

Calculation: This assumption correspond to energy of ~402 GWh annually.Using coal emission factors of 0.9–1.0 tCO_2/MWh, associated emissions are 0.36–0.40 $MtCO_2$/year.

Implication: Operating thermal unit close to optimal load reduces emissions intensity and assumed to reduce emissions intensity by 3–5%, which corresponds to an avoided intensity-equivalent of ~11,000–20,000 tCO_2/year.

Interpretation.

This represents an **emissions-intensity improvement**, not an absolute emissions reduction

Figure 3. Emissions impact logic under extended one-shift stabilization. The Figure illustrates better emission control with BESS.

7. Regulatory Treatment in India

This section situates the proposed

thermal-integrated BESS within India's regulatory framework, distinguishing between explicit, draft, and case-specific pathways, while avoiding over-claiming.

7.1 Regulated tariff pathway (Section 62) — draft and evolving

CERC draft amendments propose recognizing integrated storage under cost-plus tariffs (Section 62), with provisions on capacity, auxiliary use, and efficiency accounting; if notified, this could enable recovery under Sections 62 and 79, but it currently has no legal force.

7.2 Treatment under existing PPAs — case-specific

Integration is not automatic; it requires beneficiary consent, regulatory approval, and rule compliance. Draft recognition does not amend contracts; adoption remains station specific.

7.3 Participation in system operations and markets

Storage may provide ancillary services (2022), support DSM compliance, and participate in DAM/RTM under 2021 rules; procedures remain evolving.

8. Cost–Benefit Assessment

This section presents a conservative cost–benefit assessment of integrating a 300 MWh BESS with a 500 MW thermal unit under the proposed extended one-shift operating framework. A 2% annual degradation rate is assumed, and cumulative benefits over N years are modeled using degradation-adjusted closed-form expression:

$$B_c = B_0 * \frac{1-(1-d)^N}{d}$$

where B_c is the cumulative benefit Over N years, B_o is initial annual benefit, d is the annual degradation rate (0.02), the term $\frac{1-(1-d)^N}{d}$ represents the degradation adjustment factor, calculated as **12.85**.

8.1 Capital Cost

By using VGF Tranche-1 ceiling (₹46 lakh/MWh) and a benchmark CAPEX of ₹1.5 crore/MWh: The gross CAPEX ≈ ₹450 crore, VGF ≈ ₹138 crore, and net CAPEX ≈ ₹312 crore.

This benchmark is indicative; actual costs will be discovered and may vary during competitive bidding.

8.2 Annual Monetized Benefits

Calculations already presented in Section 5 has been used , this subsection only consolidates key monetized benefit into a single summary table for life-cycle valuation and investment appraisal.

Table 2. Degradation-adjusted life-cycle monetized benefits from extended one-shift operation with BESS (15-year horizon, indicative)

Benefit stream	Basis of estimation	Annual value range (₹ crore/ year)	15-year degradation-adjusted value (₹ crore)
Energy arbitrage	Section 5.1	29.57	380
Avoided cycling-related O&M	Section 5.2	2.5–6	32–77
Fuel savings from heat-rate improvement	Section 5.3	8.0–11.3	103–145
Ancillary/ system support services	Conservative placeholder, subject to regulation	3–4	39–51
Total gross benefit	—	**42–51**	**554–653**

Note: Life-cycle values are obtained using a degradation-adjusted cumulative benefit factor of 12.85, corresponding to a 2% annual degradation rate over a 15-year project life.

When expressed as an average over the project life, the degradation-adjusted benefit corresponds to approximately ₹36 - ₹44 crore per annum.

8.4 Investment Appraisal and Financial Viability

Metric	Value
Net CAPEX	₹312 crore
Project life	15 years
Annual degradation	2%
Total Gross benefit (Avg)	₹607.83 crore

Average annual benefit (Degradation factored)	₹40.52 crore/year
Present value (PV) of benefits	₹332.8 crore
Net present value (NPV)	+₹20.8 crore
Benefit–cost ratio (BCR)	1.07
Internal rate of return (IRR)	10.41%
Simple payback period	~8 years
Discounted payback period	~13 years

Table 3: Summary of investment appraisal metrics for thermal-integrated BESS

Note: NPV, IRR, BCR, and payback are computed using standard DCF methods with a 9.226% discount rate, aligned with CERC guidelines (70:30 debt–equity, 14% RoE ceiling, SBI 1-year MCLR as debt proxy).

Note: Detailed sensitivity and threshold analyses assessing the robustness of these results to variations in key assumptions are presented in Appendix A.

8.5 Strategic (Non-priced) Benefits

- **Reduced outage risk and thermal stress:** Deep part-load operations and ramps will be reduced , resulting in reduced fatigue and extended equipment life.
- **Improved dispatch predictability:** Stable operation above technical minimum load simplifies operation schedules and reduces balancing complexies.
- **Lower emissions intensity:** Operating plant near optimal heat rates reduces coal use and further reduce emission rates per MWh.
- **Higher renewable absorption:** BESS buffers solar peaks without forcing inefficient thermal operation.
- **Enhanced grid resilience:** Fast-response storage improves local frequency and voltage support.

9. Comparative Assessment

Parameter	Conventional	Extended One-Shift
Ramp Frequency	High	Low
Heat Rate	Sub-optimal	Near optimal
O&M Cost	High	Lower
Emissions	Higher	Lower
Grid Support	Limited	High

10. Policy Implications

This evaluation offers policy-relevant insights for India's thermal power sector, which reflects the emerging regulatory framework rather than existing guidelines.

i. **Thermal flexibility role:** BESS should be recognised as a buffer for thermal power generation, rather than renewable energy storage buffer.

ii. **Support mechanisms:** VGF schemes are to be enhanced for thermal-integrated BESS where benefits are high.

iii. **Tariff clarity:** CERC provisions on cost recovery, adjustments to efficiency, and charges is essential for certainty in investments.

iv. **System planning:** Including thermal–storage hybrids in adequacy and capacity expansion studies could improve power reliability and lower costs.

11. Conclusion

Due to rapid integration of renewables , Thermal power plants in India are facing stress due to cycling inefficiencies ,higher O&M costs and higher emission intensity. The extended one shift operation (75 MW/300 MWh BESS with 500 MW) stabilises operations during solar peak by delivering ₹29.6 crore/year from arbitrage,₹2.5–6 crore from avoided cycling, ₹8.0–11.3 crore from fuel savings, 11,000–20,000 tCO_2 reductions, and positive 15-year NPV (₹20.8 crore), with IRR > WACC. MA

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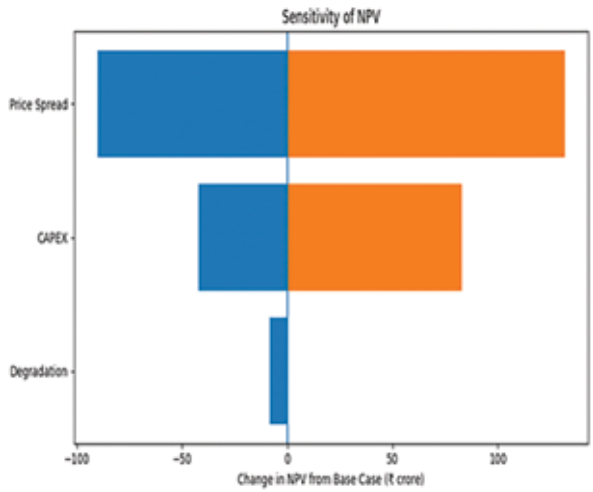
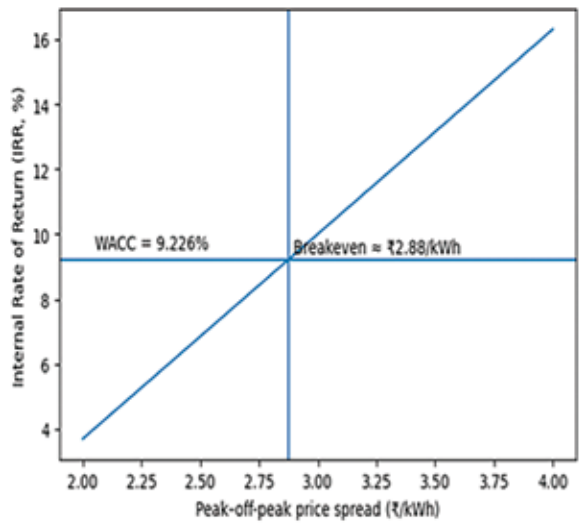
Appendix A. Sensitivity and Threshold Analysis



a) Tornado chart showing sensitivity of NPV to key parameters.



b) IRR Threshold

Figure 4. Sensitivity and threshold analysis of project viability.

Note: Figure (a) shows deviations from the base-case NPV (₹20.8 crore) due to changes in price spread), capital cost, and degradation. Figure (b) marks WACC (9.226%) and the IRR breakeven spread (≈₹2.88/kWh).

c) Sensitivity of project payback periods to key parameters

Parameter	Case	Simple Payback (years)	Discounted Payback @9.226% (years)
CAPEX	₹250 crore	6.0	9
CAPEX	₹312 crore (base)	8.0	13
CAPEX	₹375 crore	9.0	>15
Price spread	₹2/kWh	12	>15
Price spread	₹3/kWh (base)	8.0	13
Price spread	₹4/kWh	6.0	8
Degradation	1% p.a.	7.0	12
Degradation	2% p.a. (base)	8.0	13
Degradation	3% p.a.	8.0	15

Note: Simple payback is computed on an undiscounted basis, while discounted payback incorporates a 9.226% discount rate and a 2% annual degradation in usable BESS capacity in the base case.

THE MANAGEMENT ACCOUNTANT

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- Contributors are requested to send soft copies (in MS Word format) to The Editor, The Management Accountant at ***editor@icmai.in.***
- In case of theme article, the soft copy to be mailed to the above stated mail ID latest by 1st of the preceding month in which the article is sought to be published. That is, for an article to be published in February, the same may be forwarded by 1st of January, at least.
- The articles must be relevant to the economy, society and the nation.
- The articles should be around 1500 to 2000 words and must be an exclusive contribution for the Journal.
- The cover page should contain the title of the paper, author's name, designation, official address, contact phone numbers, e-mail address and an abstract of not more than 150 words.
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With best compliments from

The Institute of Cost Accountants of India, Nellore Chapter

With best compliments from

The Institute of Cost Accountants of India, Thrissur Chapter

Down The Memory Lane

February, 2016

CMA P V Bhattad, President of the Institute felicitating Hon'ble Shri Amit Shah, President BJP on February 1, 2016 at New Delhi

'National CMA Practitioners' Convention 2016' on 21 February, 2016, at Kolkata

February, 2016

'Make in India' Week (13th -18th February, 2016, Mumbai)

February, 2006

Participants along with the Faculty Prof. S. Sampath during the inauguration of the programme on 'Emerging Issues in Corporate Finance' held at Gangkok

February, 1996

Harijiban Banerjee, President ICWAI, speaking at the workshop on Central Excise Valuation Audit at Calcutta on February 1, 1996

R Nanjappa, General Manager, Reserve Bank of India, speaking at a programme on International Trade Finance organized by NIRC at Scope Complex, New Delhi on 26 February, 1996

Down The Memory Lane

February, 1986

Inaugural Session of the Seminar on "Zero Based Budgeting" on 1 February 1986 at Badhkal Lake, Faridabad

Seated on the dais from left to right are Sh SS Oberoi, Organizing Secretary of the Seminar; Sh H K Batra, Chairman of the Chapter; Sh Prakash Tandon, Chief Guest; Sh R J Goel, Chairman NIRC; and Sh K V Sharma, General Secretary of the Chapter

28th National Convention of Cost and Management Accountants on 21st February – 23rd February 1986 in Calcutta

February, 1976

Shri K.N. Kaul, Vice-Chancellor, Chandra Sekhar Azad Agricultural & Technological University, Kanpur giving his Presidential Address. Shri Shivanath Singh Kushwaha, Dy. Speaker, U.P. Assembly inaugurated the Seminar. Shri G.S. Gupta, Chairman, NIRC, Shri K.B. Agarwal, Chairman, Kanpur Chapter, and Shri H.P. Singh, Secretary, Kanpur Chapter at the seminar at the Merchants Chamber Hall on 1st February, 1976 under the auspices of the Northern India Regional Council of the Institute of Cost and Works Accountants of India.

Inaugural address by Padma Bhushan Shri T.S. Avinashilingam.

Others sitting left to right, Shri V. Nageswaran, Hony. Secretary of the Chapter, Shri K.S.G. Subramanyam, Chairman of the Chapter and Shri K.V. Narayanaswamy, who presided over the function of the inauguration of oral coaching class on 4th February, 1976

Source: Extracted from the various issues of The Management Accountant Journal

NEWS FROM THE INSTITUTE

EASTERN INDIA REGIONAL COUNCIL

Career Awareness Initiatives

On January 7, a session was held at Victoria College Institution where CMA Anup Chatterjee introduced over 60 students and teachers to the CMA curriculum. This was followed by a program at Kanchrapara College on January 8, led by CMA Dr. Subrata Mukherjee, which engaged more than 90 participants in exploring professional career paths.

Mandatory Student Trainings

Two key training programs commenced this month: a 10-day Industry Oriented Training Programme (IOTP) for Final students (Jan 13–24) and a comprehensive Skill Training Programme for Intermediate students (Jan 13–30). The latter focused on practical expertise in SAP, MS Office, Tally, E-Filing, and soft skills.

Saraswati Puja Celebrations

On January 23, EIRC celebrated Maa Saraswati Puja with great devotion. The event saw a gathering of nearly 200 attendees, including council members, former presidents, faculty, and students, who participated in the rituals and prasad sevan.

Foundation Felicitation Ceremony

To motivate the next generation of professionals, a ceremony was held on January 24 to honor students who qualified for the CMA Foundation. Distinguished dignitaries, including CMA Chittaranjan Chattopadhyay and CMA Arati Ganguly, congratulated the achievers and offered career guidance.

CPE on Practical AI Tools

On January 24, over 120 members attended a Continuing Professional Education (CPE) program titled “Practical AI Tools & Techniques for CMA Professionals.” The interactive session highlighted how AI can be leveraged strategically within the evolving landscape of cost and management accounting.

Student Quiz and Essay Competitions

Commemorating "Sustainable Month," EIRC organized academic competitions on January 24. Students showcased their knowledge through a written quiz and essay contest, supervised by the EIRC leadership to foster academic interaction and awareness of sustainability.

77th Republic Day Celebration

The EIRC premises observed the 77th Republic Day on January 26 with patriotic fervor. CMA TCA Srinivasa Prasad, President of ICMAI, unfurled the National Flag in the presence of over 100 participants, including several former presidents and regional council members.

BHUBANESWAR CHAPTER

Professional Development and Health Initiatives

The Chapter held its 4th Monthly Study Circle Meeting on December 27, 2025, focused on recent updates in Income Tax filing. Following this, on December 28, a Free Health Check-Up Camp was organized at CMA Bhawan in collaboration with Apollo Hospitals. Around 50 members benefited from professional medical screenings and consultations.

SAMPARK 2.0: Senior Citizens Meet

On January 4, 2026, the Chapter hosted "SAMPARK 2.0," a unique gathering for over 60 senior CMA members. The event combined health awareness—featuring specialists from SUM Ultimate Medicare—with an interactive session where veterans shared professional wisdom and life lessons, fostering strong inter-generational bonds within the institute.

Academic and Career Outreach

The 75th Oral Coaching Session for the June 2026 term was officially inaugurated on January 15, with 100 students in attendance. Additionally, a Career Awareness Programme was conducted at Pipli College on January 17. Chapter leadership, including Chairman CMA Sarat Kumar Behera, briefed over 100 commerce students on the CMA curriculum and diverse global career opportunities.

Cultural and Patriotic Celebrations

The Chapter premises came alive on January 23 for Saraswati Puja, drawing an overwhelming crowd of over 400 students, members, and staff to seek the blessings of the Goddess of Learning. On January 26, the 77th Republic Day was observed with a flag-hoisting ceremony led by Chief Guest CMA Saktidhar Singh. The event focused on the vision of "Viksit Bharat 2047," urging the 100+ attendees to contribute to the nation's professional and constitutional progress.

Glimpses of Eastern India Regional Council

Eastern India Regional Council

Eastern India Regional Council

Bhubaneswar Chapter

Bhubaneswar Chapter

NORTHERN INDIA REGIONAL COUNCIL

Navigating GST Litigation

NIRC hosted an insightful seminar on "How to Handle Litigation under GST" on January 16, 2026, at CMA Bhawan, New Delhi.

Led by keynote speaker CMA Atul Kr. Gupta (former Chairman-NIRC), the session focused on practical solutions for real-world tax challenges. The event featured highly interactive discussions, where participants explored case-based strategies and expert techniques for managing GST disputes effectively.

JODHPUR CHAPTER

Republic Day Celebration and Announces SMILE 3.0

The Chapter celebrated Republic Day with a patriotic flag unfurling ceremony attended by key dignitaries, including Council Member, CMA Rajendra Singh Bhati and Chapter Vice Chairman CMA Rajendra Prasad Dhariwal. The event, supported by over 50 enthusiastic students and members, served as the launchpad for SMILE 3.0 (Small & Medium Industries Leveraging Economy). This flagship mega-event is scheduled for March 6–8, 2026, and will feature technical, sports, and

cultural activities for an estimated 500 participants. The dual celebration underscores the Chapter's dedication to national pride and the professional growth of the cost accounting community.

Glimpses of Northern India Regional Council

Northern India Regional Council

Northern India Regional Council

Jodhpur Chapter

Jodhpur Chapter

SOUTHERN INDIA REGIONAL COUNCIL

SIRC Hosts Comprehensive 4-Day Webinar Series on Cost Audit

From December 27 to 30, 2025, SIRC conducted a specialized 4-day webinar series via Microsoft Teams, aimed at strengthening the practical expertise of CMA practitioners. Led by SIRC Chairman CMA Vijay Kiran Agastya, the series covered:

- Day 1 (Fundamentals): CMA Vishwanath Bhat opened with the core principles of cost audit, reconciliation, and the necessity of value-added reporting beyond statutory compliance.
- Day 2 (Engineering): CFO of Bosch, CMA Sampara Sivaramakrishna, and CMA H. R. Sreepada bridged the gap between industry expectations and auditing practices, focusing on standard costing and SAP/COPA environments.
- Day 3 (Power Sector): CMA D. Jitendra Rao provided a deep dive into the regulatory frameworks of thermal, renewable, and hydro power, addressing sector-specific challenges like fuel efficiency and line losses.
- Day 4 (Healthcare): CMA Pushpy Muricken concluded the series by exploring Activity-Based Costing (ABC) in hospitals and the impact of regulatory pricing controls like Ayushman Bharat.

20th S. Ganapathisubramanian Memorial Lecture

On January 6, 2026, SIRC honored the legacy of Late S. Ganapathisubramanian at CMA Bhawan,

Chennai. The keynote speaker, strategic expert CMA M. Hariharan, delivered a compelling lecture titled "From Clarity to Sustainability." The session, attended by ICMAI President CMA TCA Srinivasa Prasad and other distinguished council members, explored how CMAs can integrate sustainability into modern cost management. The event concluded with a vote of thanks from Former President CMA M. Gopalakrishnan, reinforcing the Institute's commitment to thought leadership.

Commemoration of the 77th Republic Day

The SIRC fraternity gathered at CMA Bhawan, Egmore, on January 26, 2026, to celebrate India's 77th Republic Day. The National Flag was unfurled by SIRC Chairman CMA Vijay Kiran Agastya in the presence of CMA Praveen Kumar and other key stakeholders. The ceremony served as a solemn reminder of the CMA profession's role in nation-building, economic governance, and upholding the ethical standards enshrined in the Indian Constitution.

BENGALURU CHAPTER

Analytics Workshop and Republic Day Celebrations

The Chapter recently hosted two significant events focused on professional growth and national pride. On January 24, 2026, the Chapter organized a Professional Development Programme titled "Analytics using MS Excel," featuring expert insights from CMA Muralidhara K.S. and supported by leadership including Chapter Chairman CMA Raghavendra B.K. and Vice Chairperson CMA Gunamala S.R. Following this technical session, the Chapter commemorated India's Republic Day on January 26, 2026. The patriotic ceremony was graced by prominent members, including CMA Vishwanatha Bhat (PF Chairman, SIRC) and CMA Ramesh S. (Former Chairman, SIRC), alongside dedicated staff and members, reaffirming the Chapter's commitment to both professional excellence and community spirit.

THRISSUR CHAPTER

Health, Compliance, and Community Celebrations

The Chapter maintained a dynamic schedule through December and January, balancing professional development with personal well-being and community bonding:

- Wellness and Finance: On December 7, 2025, the Chapter partnered with the Thrissur Management Association for a unique seminar, "Investing in your Health: Your Highest-Returning Investment." Dr. Merin Paul, Medical Director of Trinity Eye Hospital, shared vital insights on prioritizing health as a professional asset.
- GST Technical Session: Shifting to core competencies, a CEP programme on "GST Annual Return & Reconciliation" was held on December 21, 2025. CA Soman N. L. led the session, providing practitioners with practical guidance on year-end compliance and reconciliation strategies.
- Gather & Glow 2026: The Chapter rang in the New Year with a grand reunion, "GATHER & GLOW 2026," on January 3, 2026, at Hotel Merlin International. Inaugurated by CMA Praveen Kumar (SIRC PD Committee Chairman) and hosted by Chapter Chairman CMA P.V. Antony, the evening honored local Practicing Cost Accountants. The event saw a massive turnout of 300 members and families, featuring music, dinner, and a spirit of professional camaraderie.

TRIVANDRUM CHAPTER

Strategic Growth and Community Recognition

The Chapter executed a series of high-impact Professional Development Programmes (PDPs) and community events at CMA Bhawan to close out 2025:

- Strategic & Operational Excellence: The Chapter hosted sessions on "Internal Audit – A Management Perspective" by CMA Prasanna Kumar S (Nov 23) and "Strategic Cost Management in Action" (Dec 3) led by SIRC Chairman CMA Vijay Kiran Agastya.
- Regulatory Compliance: Specialized sessions addressed practical hurdles in the profession, including "GST Annual Return Filing" with CMA Ajith Sivadas (Dec 7) and an in-depth analysis of "India's New Labour Codes" by CS Visakh Madhusudhanan (Dec 15).

- Milestones and Felicitations: On December 3, the Chapter officially released its Biannual Activity Chronicle, "TCCA Prayaan," unveiled by CMA Vijay Kiran Agastya. Additionally, a heartwarming felicitation ceremony was held to honor the academic, artistic, and athletic achievements of members' children, reinforcing the Chapter's focus on the broader CMA family.

Under the leadership of Chapter Chairman CMA Pranav Jayan and Secretary CMA Nisha Habi, these events successfully blended technical expertise with institutional growth and member engagement.

COIMBATORE CHAPTER

A Season of Growth, ESG Leadership, and National Excellence

The Chapter demonstrated exceptional leadership and student engagement throughout the final months of 2025 and a landmark January 2026. Highlights of their activities include:

- National Landmark: NCMAC 2026: The Chapter co-hosted the 63rd National Cost and Management Accountants' Convention (NCMAC) from January 9–11, 2026. Under the theme "RISE India," the event drew over 1,000 delegates and featured high-profile speakers like Shri Narayan Sethuramon and CMA TCA Srinivasa Prasad. The success was later celebrated on January 19 with a "Felicitation to Champions" ceremony for student volunteers.
- Professional Development & ESG: In December, the Chapter hosted a unique workshop on professional branding titled "RISE Through Writing," led by CMA Hariharasubramanian A. Additionally, Chapter leadership participated in the ESG Summit 2025 in Kerala, gaining critical insights into sustainability standards and governance.
- Academic Outreach & Coaching: The Chapter inaugurated its 101st Oral Coaching Session on December 23. Outreach efforts reached nearly 1,000 students across various institutions, including a massive orientation at PSGR Krishnammal College and a high-level career session at Suguna College featuring two Former Presidents of ICMAI.
- Student Success & Patriotism: Coimbatore students proved their mettle by securing Third Prize in the Share Market event at the "PRAGATHI 2026" talent show in Cochin. The month concluded with 77th Republic Day celebrations and a specialized Study Circle Meeting focused on Cost Audit Reforms.

Through these diverse initiatives, led by Chairman CMA Dr. R. Maheswaran, the Coimbatore Chapter has solidified its role as a hub for professional competence and nation-building.

VIJAYAWADA CHAPTER

Council Member, CMA Vinayaranjan and SIRC Members, K Panduranga Rao, Vijayawada Chapter Staff at the Mega Commerce Conclave organised by Commerce Alumni of Andhra Pradesh Residential Degree College, Nagarjuna Sagar, Andhra Pradesh on 24-Jan-2026. About 200 Commerce Students & more than 200 Alumni members of the APRDC have taken part in this programme.

Glimpses of Southern India Regional Council

Southern India Regional Council

Southern India Regional Council

Bengaluru Chapter

Bengaluru Chapter

Thrissur Chapter

Thrissur Chapter

Trivandrum Chapter

Trivandrum Chapter

Coimbatore Chapter

Coimbatore Chapter

Vijayawada Chapter

WESTERN INDIA REGIONAL COUNCIL

Sports, Specialized Learning, and Career Success

The Western India Regional Council concluded 2025 with a dynamic mix of physical activity, intensive professional training, and landmark placement results.

Sports Day 2025: Strategic Moves

On December 20, 2025, WIRC hosted its annual Sports Day, promoting camaraderie and mental agility. Key highlights include:

- Chess: Council Member CMA (Dr.) Ashish Prakash Thatte claimed the winner's trophy, with Faraz Ahmed Murumkar as runner-up.
- Carrom: Yash Karangutkar emerged as the winner, followed by Mandar Mayekar. Dignitaries including CMA Harshad Deshpande and CMA Chaitanya Mohrir presided over the medal distribution.

Professional Development: The "Gyan Satra" Series

Throughout December, WIRC conducted an extensive Webinar Series on Cost Audit and specialized CPE programmes.

- Sector-Specific Cost Audits: Expert-led sessions covered the Aluminium, Hospital, Fertilizer, Steel, and Sugar industries.
- Modern Finance Domains: CMA Siddhartha Pal delivered a two-part masterclass on ESG and BRSR Frameworks, while CMA Chitralee Goswami handled sessions on GeM Procurement and Total Cost Management.
- Ethics & Practice: Council Member CMA (Dr.) Ashish Prakash Thatte led a critical discussion on the draft advertisement guidelines for practicing members.

Campus Placement: 157 Careers Launched

In a major milestone for the June 2025 batch, 157 newly qualified CMAs have been placed across the Western Region as of December 18. Under the leadership of President CMA T.C.A. Srinivasa Prasad, high-profile recruiters included:

- Top Employers: Cosmos Co-Op. Bank Ltd (62 selections), Accenture (32), and RSM Astute (14).
- Diverse Sectors: Placements spanned across ITC Hotels, Sun Pharma, Capgemini, and NBCC, reflecting the high demand for CMA expertise in various industries.

NASHIK CHAPTER

Golden Jubilee Initiatives and Student Outreach

The Chapter advanced its Golden Jubilee celebrations with a series of high-impact professional and academic programs during December 2025:

- Golden Jubilee CPE Webinar: On December 20, 2025, Chapter collaborated with the Nagpur, Chh. Sambhaji Nagar, and Pune Chapters to host its 15th CPE Webinar on "ESG & Sustainable Development." CS Deepak Jain provided members with critical insights into the Environmental, Social, and Governance frameworks now shaping global business.
- Military College Career Guidance: On December 29, 2025, the Chapter reached out to students at Bhonsala Military College of Commerce. CMA Priyanka Burkul led the session, providing over 50 students with a clear roadmap of the CMA course structure and the

professional advantages of the qualification.

- Gokhale Education Society Career Fair: The Chapter concluded the year on December 31, 2025, with a prominent stall at the BYK College of Commerce Career Fair. Chapter Chairman CMA Dhananjay Jadhav felicitated Dr. P. M. Deshpande (Director, Gokhale Education Society) during the inauguration. The event successfully converted high student interest into active career counseling for aspiring accountants.

PIMPRI CHINCHWAD CHAPTER

Extensive Outreach, Legal Readiness, and Experiential Learning

The Chapter concluded December 2025 with a series of initiatives focused on nurturing young talent, updating professional knowledge, and building student camaraderie.

Strategic Career Counseling Blitz

Throughout December, Chapter leadership—including Immediate Past Chairman CMA Ajit Shinde and Vice Chairman CMA Kunal Wakte—conducted a series of orientation sessions at various junior colleges to introduce the CMA profession to 12th-grade commerce students:

- Adarsh Junior College (Dec 10 & 12): Sessions focused on industry trends, global career paths, and the detailed CMA curriculum.
- Chatrapati Shivaji Vidya Mandir (Dec 19): Leadership shared personal career journeys and clarified doubts regarding internships and job prospects.
- Pavana Vidya Mandir (Dec 19): Over 100 students participated in an open forum discussing the relevance of professional qualifications in a competitive business environment.

Professional Readiness: Labour Law 2025

On December 20, 2025, the Chapter hosted a high-level webinar, "Getting Ready for Labour Law 2025," on MS Teams. Keynote speaker CMA Ashok Nawal, a veteran practitioner, provided an in-depth analysis of upcoming changes to:

- Wage Codes and Social Security measures.
- Occupational Safety provisions and employer responsibilities.
- Compliance Strategies for organizations to transition seamlessly into the new legal framework. The session, welcomed by CMA Mahendra Bhombe (RCM–WIRC), equipped participants with the regulatory foresight needed for the coming year.

Holistic Development: Educational Excursion

To promote team building and cultural awareness, the Chapter organized a two-day trip to Dive Agar and Murud-Jinjira Fort on December 20–21, 2025. Students explored the architectural and strategic history of the iconic sea fort while enjoying the coastal landscape. Accompanied by faculty and staff, the excursion blended historical education with recreation, fostering leadership and bonding among the student fraternity.

SURAT-SOUTH GUJARAT CHAPTER

From Strategic ESG to Technical SAP Mastery

The Chapter concluded December 2025 with a high-impact series of webinars and workshops designed to enhance both the technical skills and professional conduct of its members.

Strategic and Regulatory Webinars

- ESG and Profitability (Dec 24): CMA Anuradha Dhavalikar led an insightful session on "Exploring ESG & Profitability Dynamics for MIS," helping 40 online participants understand how environmental and social governance integrates with financial reporting systems.
- Advertisement Guidelines (Dec 27): In a joint initiative with the Chhatrapati Sambhajinagar and Pune Chapters, Council Member, CMA Ashish Thatte addressed 50 practitioners regarding the "Draft Council Guidelines for Advertisement, 2025." This session was critical for members in practice to understand the evolving ethical framework for professional promotion.

Practical Professional Workshops

- Personal Effectiveness (Dec 26): Ms. Mamta Mehta conducted a workshop on "Personal Effectiveness for Professional Growth," which drew a strong attendance of 130 participants. Chapter Chairman CMA Kishor Vaghela

felicitated the speaker for her session on soft skills and professional leadership.

- SAP Mastery (Dec 27): Highlighting the demand for technical proficiency, CMA Darshan Patel delivered a specialized workshop on "SAP." The event saw the highest turnout of the series with 160 participants and was coordinated by Treasurer CMA Ashvin Ambaliya, focusing on the practical application of ERP systems in cost management.

AHMEDABAD CHAPTER

Strategic Learning, Student Success, and Operational Excellence

The Chapter closed out 2025 and began 2026 with a diverse portfolio of professional development, student support, and modernization initiatives.

Professional Development and Wellness

- Residential Program at Sasan (Dec 5–7): A three-day immersive event featured technical sessions on AI integration by CMA Jalpan Dholakia, Aggregate Planning by CMA Chirag Modh, and GST Reverse Charge Mechanism (RCM) by CMA Bharat Patel.
- Specialized Webinars: The Chapter explored niche professional avenues, including opportunities in the Trust and NGO sectors (Dec 3) and Investment Decision Making (Dec 19). They also held a critical consultation on the Draft Council Guidelines for Advertisement 2025 on December 26.
- Health Check-up Camp (Dec 20): In collaboration with Apollo Hospital, a comprehensive health camp was hosted at the Chapter premises for members, students, and their families.

Student Milestones and Career Support

- Foundation Results Press Meet (Jan 8): Following the December 2025 exams, Chairman CMA Mitesh Prajapati hosted a press conference. Leading media outlets interviewed meritorious students, highlighting the chapter's academic excellence.
- Articleship Recruitment Drive (Jan 16–17): Six organizations participated in a focused drive at the Chapter premises. 31 candidates registered and interviewed, bridging the gap between aspiring students and professional training opportunities.

Academic Modernization: Faculty Meet 2026

On January 17, 2026, the Chapter convened a Faculty Meet to implement key digital and academic updates:

- Smart Board Orientation: Training on newly installed interactive boards to enhance classroom engagement.
- Digital Infrastructure: Introduction of Face ID attendance for faculty and optimized time-management strategies for the current syllabus.

BARODA CHAPTER

Advancing Policy, Academia, and Achievement

The Chapter has had a highly productive season, marked by significant regulatory engagement, strategic academic partnerships, and exceptional student results.

Regulatory and Policy Engagement

On December 30, 2025, the Chapter participated in a high-profile outreach program on "GST Reforms 2.0" organized by DGTS. The session featured senior government officials, including Shri Sumit Kumar (Pr. ADG, DGGST) and Shri Karamvir Singh (Commissioner, Vadodara CGST), providing members with direct insights into the evolving GST framework and its practical industrial implications.

Strengthening Industry-Academia Synergy

In a major push for the National Education Policy (NEP) 2020, the Baroda Chapter has significantly deepened its ties with The Maharaja Sayajirao University (MSU) of Baroda:

- Internship Initiative: The Chapter is facilitating mandatory 120-hour internships for B.Com (Honours) students, calling upon CMA members and firms to mentor the next generation in accounting and taxation.
- Infrastructure Support: Following a strategic meeting with Vice Chancellor Prof. J. K. Pandya, MSU has graciously agreed to provide classrooms for CMA oral coaching classes while the new CMA Bhavan is under construction.

Excellence in Academics and Placement

- CMA Foundation Success: The Chapter recorded an outstanding 74.08% pass rate in the December 2025 examinations. Out of 355 students, 263 passed, with Arman Sanjay Kumar Rana clinching the top rank.
- Placement & Training: Extensive activities were conducted to ensure career readiness, with a large number of students and members successfully leveraging the Chapter's placement cell for professional opportunities.

Sports and Camaraderie

On January 24, 2026, the Chapter hosted the Inter Chapter Cricket Tournament at Aryan Cricket Academy. Featuring teams from the Baroda and Nashik Chapters along with MSU, the event was a vibrant display of sportsmanship and inter-regional bonding.

INDORE-DEWAS CHAPTER

Exploring Agricultural Frontiers and Celebrating Success

On January 17, 2026, the Chapter, in collaboration with the Agriculture Cost Management Board (ACMB), hosted a pivotal CPE program titled "Role of CMAs in FPOs and Vikshit Bharat." The session focused on the expanding role of Cost Accountants in Farmer Producer Organizations (FPOs) as a cornerstone of national development.

- Expert Insights: Keynote speaker CMA Jyotsna Rajpal and Chief Guest CMA Chittranjan Chattopadhyay (Chairman, ACMB) highlighted how CMAs can drive efficiency and value addition in the agricultural supply chain, transforming traditional farming into a professional business model.
- Fostering Future Talent: Chapter Chairman CMA Pankaj Kumar Raizada welcomed a diverse audience of members and industry representatives. A highlight of the evening was the felicitation of meritorious students who excelled in the December 2025 Foundation examination, bridging the gap between current practitioners and the next generation of professionals.

Glimpses of Western India Regional Council

Western India Regional Council

Western India Regional Council

Nashik Chapter

Pimpri Chinchwad Chapter

Pimpri Chinchwad Chapter

Surat-South Gujarat Chapter

Surat-South Gujarat Chapter

Ahmedabad Chapter

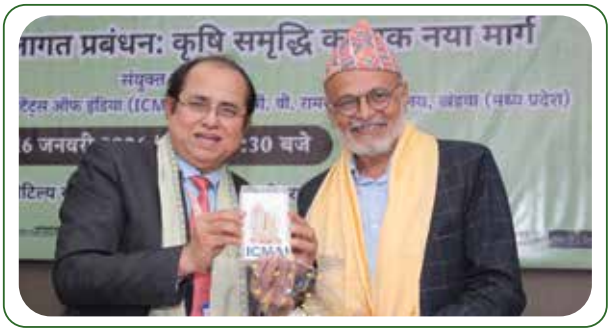
Ahmedabad Chapter

Baroda Chapter

Baroda Chapter

Indore-Dewas Chapter

Signing of Memorandum of Understanding (MoU)



A **Memorandum of Understanding (MoU)** was signed between the Institute of Cost Accountants of India (ICMAI) and Dr. C. V. Raman University (C.V.R.U.) Khandwa on 16th January 2026 at Khandwa, Madhya Pradesh. The MOU aims for knowledge sharing in the field of agriculture Cost Management that would mutually benefit both the Institutions and contribute meaningfully to the agriculture sector. Through this MoU, the ICMAI and the University can jointly design and deliver specialized courses, share faculties, training resources, academic publications, and research support that can raise the quality of teaching and extend expert knowledge into agriculture cost management. The collaboration will enable academia to engage with the real time sectoral challenges and help to translate cost management theory into practical strategies that can influence agri-policy and farm-level decision making.

The occasion was graced by CMA Chittranjan Chattopadhyay – Chairman Agriculture Cost Management Board (ACMB) of ICMAI and Dr. Arun R. Joshi Vice Chancellor of - Dr. C V Raman University.

Shri Ravi Chaturvedi, Registrar of Dr. C.V. Raman University, Dr. Varun Mahajan COS Maharshi Kautilya School of Commerce, Dr. C. V. Raman University, Khandwa & CMA (Dr.) Sumita Chakraborty Secretary ACMB and CMA Jyotsna Rajpal – Co-opted Member ACMB, CMA Pankaj Kumar Raizada, Chairman of Indore Chapter & CMA Swati Modi – Member, Managing Committee of Indore Chapter were present on behalf of ICMAI.

The function was attended by more than 200 persons including University Faculty Members, Members from other Research & Skill Development Institutions, Industrialist dealing in Agro Products, Bankers, Representatives from Various FPO's and other government departments.

In his address CMA Chittranjan Chattopadhyay highlighted the importance of this MOU and the role of Cost & Management Accountants in Agriculture Sector. The Vice Chancellor of CVRU thanked ICMAI for showing trust in University Management and shared the vision of the university. Former Principal Secretary of Govt. of Madhya Pradesh Dr. Ravindra Pastor also addressed the gathering.

CMA Jyotsna Rajpal gave a presentation on Importance of Cost Management in Agriculture Sector.

On this occasion, **A Guidance Note for FPO's**, prepared by ACMB was also released by the dignitaries. MA

THE MANAGEMENT ACCOUNTANT

PAPERS INVITED

Cover Stories on the topics given below are invited for ***'The Management Accountant'*** for the four forthcoming months

March 2026	Theme	Give to Gain: Women Driving Financial Sustainability through Strategic Management Accounting
	Subtopics	⊙ Women Leaders Giving Vision to Gain Financial Sustainability ⊙ Women Accountants as Ethical Stewards: Giving Integrity to Gain Trust ⊙ Women Mentors in Finance: Giving Guidance to Gain Growth ⊙ Women Driving Financial Inclusion: Giving Access to Gain Economic Empowerment ⊙ Women Innovators in Management Accounting: Giving Ideas to Gain Digital Advantage ⊙ Women Professionals in ESG: Giving Stewardship to Gain Sustainable Impact ⊙ Women Building Resilience: Giving Strength to Gain Organizational Stability ⊙ Women Empathetic Leadership: Giving Empathy to Gain Ethical Excellence
April 2026	Theme	Financial Year 2026–27 – Digital, Dynamic, Driven
	Subtopics	⊙ Empowering Decisions Through Data ⊙ Agile Workflows for a Fast-Changing World ⊙ Digital Cost Optimization & Real-Time Cost Visibility ⊙ Strategic Cost Management for Sustainable Value Creation ⊙ Enhancing Cost Transparency Through Integrated ERP Systems ⊙ Sustainable Growth Through Smart Technology ⊙ Strengthening Compliance Through Evolving GST Framework ⊙ Adapting to New Labour Laws Through Digital Workforce Management - Building Skills for a Future Ready Workforce
May 2026	Theme	Beyond the Horizon: Strategic Cost Management in the Evolving Aerospace Sector
	Subtopics	⊙ Strategic Cost Management in Aerospace & Defence (A&D): Transitioning from procurement-based accounting to Lifecycle Value and Total Cost of Ownership (TCO) ⊙ The Green Ledger: Financial implications of Carbon Offsets, Sustainable Propulsion, and ESG reporting in Aerospace ⊙ Digital Twin & AI: Driving productivity in MRO (Maintenance, Repair, and Overhaul) and Precision Manufacturing through technology ⊙ Governance & IBC in High-Capex Industries: Navigating regulatory hurdles and insolvency frameworks (Lessons on asset impairment and debt restructuring relevant to capital-intensive sectors) ⊙ Space Economics: The New Frontier for Management Accountants, analysing the commercialization of the space sector ⊙ Revenue Models in the "Power-by-the-Hour" Era: The shift from asset ownership (CAPEX) to service-based and availability-based models (OPEX)
June 2026	Theme	Our Small Hands to Make You Large: Corporate Mitras and the New Architecture of Professional Support for MSMEs
	Subtopics	⊙ The Concept of 'Corporate Mitras' in India's Budgetary Vision – Redefining Professional Assistance for MSMEs ⊙ Corporate Mitras Strengthening MSMEs as the Backbone of India's Economic Future ⊙ Empowering Tier-II and Tier-III India Through Local Expertise ⊙ Employment Generation and Career Pathways for Para-Professionals ⊙ From Learning to Livelihood: Creating a Cadre of Corporate Mitras ⊙ Corporate Mitras as Catalysts for Formalization and Ease of Doing Business ⊙ Policy, Regulatory, and Implementation Challenges Ahead ⊙ Unlocking MSME Potential for Inclusive Growth Through Corporate Mitras

The above subtopics are only suggestive and hence the articles may not be limited to them only.

Articles on the above topics are invited from readers and authors along with scanned copies of their recent passport size photograph and scanned copy of declaration stating that the articles are their own original and have not been considered for anywhere else. Please send your articles by e-mail to editor@icmai.in latest by the 1st week of the previous month.

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RESEARCH BULLETIN

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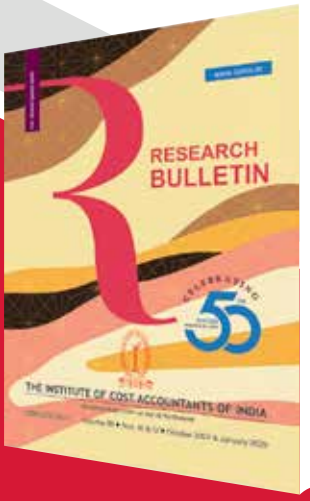

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CALL FOR PAPER

Research Bulletin, Vol. 51 No. IV January 2026 (ISSN 2230 9241)

Call for Research Papers/Articles

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Guidelines to submit full Paper

- Soft Copy of the full paper should be submitted in double space, 12 font size, Times New Roman, keeping a margin of 1 inch in four sides, MS Word (.doc) format.
- Each paper should be preferably within 5000 words including all.
- An abstract of not more than 150 words should be attached.
- The cover page should contain the title of the paper, author's name, designation, official address, contact phone numbers, e-mail address.

Papers are invited on the following topics, but not limited to:

- *The Impact of Artificial Intelligence (AI) on Financial Reporting Accuracy*
- *Cost-Benefit Analysis of Blockchain Adoption in Supply Chain Finance*
- *Integrating ESG Factors into Capital Budgeting Decisions*
- *Green Energy*
- *Cybersecurity in an AI-Dominated World*
- *Corporate Sustainability and Corporate Governance*
- *Global Health Equity*
- *Startups*
- *Banking & Insurance*
- *GST*
- *Cost Audit*
- *Customer Relationship Management (CRM)*
- *Venture capital*
- *Forensic Accounting and Auditing*
- *Securities Markets in India*

Papers must be received within
28th February, 2026
in the following email id:
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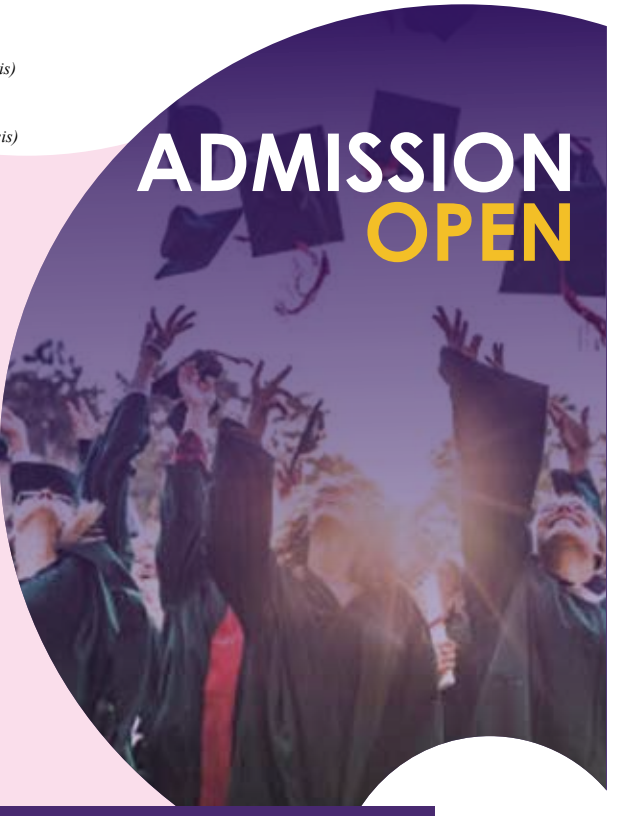
CMA Courses - Eligibility Criterion

Admission in Foundation Course

- *Passed Class 10 (Require to pass 10+2 before appearing in CMA Examination)*
- *10+2 Pass or its equivalent (Students appearing for 10+2 also apply on provisional basis)*

Registration to Intermediate Course

- *Passed CMA Foundation Examination*
- *Graduates of any discipline (Students awaiting final result also apply on provisional basis)*
- *Qualified CAT Level - I of The Institute of Cost Accountants of India*
- *Qualified CA Intermediate; Qualified Engineers; Qualified CS*



Core Strengths of CMA Profession

- Building Cost Effectiveness
- Benchmarking
- Cost & Management Accounting
- Business Strategy & Sustainability
- Effective Regulatory Landscape
- Financial Management
- Auditing & Assurance
- Enterprise Governance
- Direct & Indirect Tax Management
- Business Valuation & Product Pricing
- Cost-Benefit Analysis
- Management Control Systems

Career Opportunities for CMAs

- Service
- Practice
- Start-up
- Industry
- Academia

Course Fees

- FOUNDATION - Rs. 6,000/-
- INTERMEDIATE - Rs. 23,100/-*
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**Installment facility available*

Important Job Roles For CMAs

- CMD
- CEO
- COO
- CFO
- Director - Finance
- President - Finance
- Vice President - Finance
- Head of Finance
- Strategic Head
- Cost Advisor
- Finance Controller
- Cost Controller
- Risk Manager
- Business Analyst
- Research Analyst
- Dean/Professor of Finance

and many more .....

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CMA Qualification is recognised by NARIC (National Recognition Information Centre of UK) as equivalent to Master's Degree in U.K. and UAE

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