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भारतीय लागत लेखाकार संस्थान  
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COST ACCOUNTANTS OF INDIA**  
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Behind Every Successful  
Business Decision,  
There Is Always A CMA.



॥ सुखिनो भवन्तु ॥



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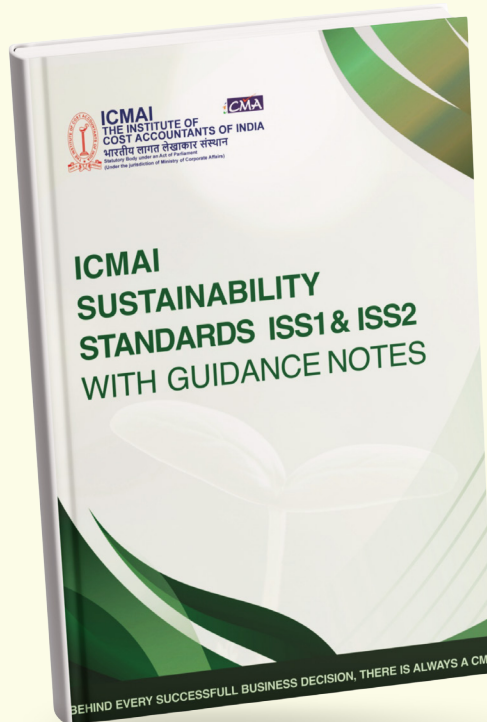
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|-----------------------------|------------------------|------------------------|----------------------|
| 1. No Poverty               | 2. Zero Hunger         | 3. Good Health         | 4. Quality Education |
| 5. Gender Equality          | 6. Clean Water         | 7. Clean Energy        | 8. Decent Work       |
| 9. Industry & Innovation    | 10. Reduced Inequality | 11. Sustainable Cities |                      |
| 12. Responsible Consumption | 13. Climate Action     | 14. Life Below Water   |                      |
| 15. Life on Land            | 16. Peace & Justice    | 17. Partnerships       |                      |





UPCOMING  
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# Message from the Chairman

**“We are the first generation to feel the effect of climate change and the last generation who can do something about it.”- Barack Obama**

The recent devastating flash floods in Nepal in August 2026 have once again reminded the world of the fragile relationship between human development and the natural environment. The catastrophe that struck the districts of Rasuwa, Nuwakot, Dhading, Gorkha and Tanahun, along the Nepal–Tibet border, swept away homes, roads and bridges, disrupted livelihoods and isolated entire communities. The immense human suffering, with a large number of people affected and many lives lost or missing, is a profound reminder that the consequences of environmental degradation and climate vulnerability can no longer be viewed as distant possibilities. Such tragedies compel us to pause and reflect. In our relentless pursuit of development, progress and economic prosperity, we must not lose sight of the ecological foundations upon which our very existence rests. When nature is continuously exploited in the name of development, we may unknowingly sow the seeds of disasters that eventually return to us with devastating consequences. Climate change is no longer an abstract or distant phenomenon; it is an unfolding reality, manifested through extreme weather events, rising temperatures, floods, droughts and ecological disruptions. The Sustainability Standards Board stands in solidarity with the people of Nepal during this difficult hour. We offer our deepest condolences to the families who have lost their loved ones and extend our heartfelt prayers for the departed souls. We also appeal to all well-wishers and members of the global community to extend every possible support to those who have lost their homes, livelihoods and possessions. At moments such as these, humanity must transcend geographical boundaries and demonstrate that compassion, solidarity and collective responsibility are the true foundations of sustainable development.

Against this backdrop, the webinar conducted on 18<sup>th</sup> September 2026 on Nepal’s Sustainable Development Strategies and Why They Failed assumes particular significance. The deliberations sought to examine the underlying vulnerabilities and lessons that sustainability practitioners, policymakers, businesses and communities must collectively consider to prevent the recurrence of such catastrophes. The tragedy should not merely remain a moment of grief; it must become a catalyst for introspection, corrective action and stronger climate-resilient development.

The SSB, in association with the Nashik Chapter, is also organising “*Samriddhi – Sustainability Simplified*” at BLVD Hotel, Hera Garden, Nashik, on 2<sup>nd</sup> October 2026. The programme will delve into diverse dimensions of sustainability and endeavour to translate the seemingly complex language of sustainability into meaningful and actionable understanding.

The choice of Nashik is particularly significant. Nashik is not merely a spiritual and cultural centre but also an important industrial hub of Maharashtra. With the city preparing to host the Nashik–Trimbakeshwar Simhastha Kumbh Mela 2027, one of India’s most significant spiritual gatherings, Nashik will soon witness an extraordinary confluence of people from across India and the world. The gathering will bring together spirituality, tradition and cultural heritage on an unprecedented scale. It therefore provides an inspiring setting to reflect upon the harmony between our cultural ethos and the principles of sustainability.

We are also delighted to announce that the ICMAI Green Awards 2024–25 will be conferred upon the deserving winners on 8 October 2026 at Vigyan Bhawan, New Delhi. This year, the Awards will recognise excellence across all four categories—Large Cap, Mid Cap, Small Cap and Voluntary Disclosures. The Awards represent our continuing endeavour to acknowledge organisations that demonstrate commitment to responsible business practices, environmental stewardship and transparent sustainability reporting.

At the standards front, we are presently at the final stage of finalisation of ISAS-1, our first assurance standard. Its completion will mark another important milestone in strengthening the credibility, reliability and assurance ecosystem surrounding sustainability disclosures. We are also progressing towards finalising the Best Article Award for articles published in the *Sukhinobhavantu* newsletter during October 2025 to September 2026. The winners are proposed to be felicitated during the Sustainability Month in January 2027, celebrating knowledge, thought leadership and meaningful contributions to the sustainability discourse. The response to the Certificate Course on ESG continues to be encouraging. Admissions for the 8<sup>th</sup> Batch are presently underway, and we look forward to commencing the programme from November 2026. The course is an important initiative towards building a knowledgeable and professionally competent community capable of navigating the rapidly evolving ESG landscape. The *Vasudhaiva Kutumbakam* webinar series has also continued its journey of knowledge and dialogue. With the completion of its 66<sup>th</sup> edition, the series has established itself as a sustained fortnightly platform exploring unconventional, thought-provoking and contemporary dimensions of sustainability. The journey itself is a testimony to our commitment to continuous learning and to the belief that sustainability must be understood not merely as a subject, but as a way of thinking and living.

The International Day for the Preservation of the Ozone Layer, observed on 16<sup>th</sup> September, further reminds us of our collective environmental responsibility. This year's theme, "Global action for a cooler planet," draws attention to one of the defining challenges of our times—the need to ensure access to efficient cooling as temperatures rise and extreme heat becomes increasingly common. Cooling is no longer merely a matter of comfort; for millions, it is becoming a matter of health, safety and survival. The challenge before us is therefore to ensure that cooling solutions are accessible, energy-efficient, environmentally responsible and equitably available.

Sustainability is ultimately about finding the delicate equilibrium between development and conservation, prosperity and responsibility, progress and preservation. It calls upon us to move beyond reacting to disasters and instead build systems that anticipate, withstand and adapt to the challenges posed by a changing climate.

Let the tragedy in Nepal not be remembered only for the destruction it caused. Let it also become a solemn reminder of what happens when the delicate balance between humanity and nature is disturbed. And let our collective response be guided by unity, compassion, science, responsibility and the timeless wisdom that we do not inherit the Earth from our ancestors; we hold it in trust for generations yet unborn.

Together, through knowledge, action and solidarity, we can transform adversity into awareness, awareness into action, and action into a more resilient and sustainable future.

Warm regards,

**CMA (Dr.) Ashish P. Thatte**

Chairman

Sustainability Standards Board

ICMAI

September 25, 2026



# Table of Contents

## SSB Salutes

Sunita Narain

Page: 6

## Monthly News

Sustainability -Global Context

Page: 7

## Monthly News

Sustainability -Indian Context

Page: 9

## Sustain The sustainability

Continent-wise Corporate Sustainability Reporting Frameworks – Mapping of SDGs and Evaluation of Diversities  
Oceania: Climate Resilience, Indigenous Rights and Emerging Sustainability Reporting

Page: 11

## Sustainable Finance: Finding The Future | Part VIII

Taxonomy – Defining what is sustainable

*Usha Ganapathy Subramanian*

Page: 15

## Esgonomics: Integrating Sustainability Into Economic Thought | Insight IV

Economics of Artificial Intelligence: Redefining Productivity, Employment and Growth

*CMA Arunabha Saba*

Page: 17

## Article I

Nepal's Lost Years, and Why Indian Capital Should Care

*Mr. Zamin Shah*

Page: 21

## Article II

ESG and Sustainability: A Smart Comparison of India's ESG Environment with European Nations

*CMA Sanjoy Ghosh*

Page: 25

## Article III

Sustainable Finance in a Vuca World: Key Focus Areas for Cost Accountants

*CMA K.T.S. Keerthy*

Page: 29

## Vasudhaiva Kutumbakam Series

Report of 64<sup>th</sup> and 65<sup>th</sup> Webinars

Page: 33

## Parinayati Series

Report of 11<sup>th</sup> Webinar

Page: 35

## Forthcoming Webinars

Vasudhaiva Kutumbakam (VK) Webinar Series & Parinayati Webinar Series

Page: 36

# Table of Contents

## **Samruddhi Brochure**

Page: 38

## **Brochure of the Certificate course on ESG**

Page: 39

## **Sustainability Musing | Part III**

AI Business Transformation and the Expanding Role of Cost and Management Accountant

*CMA (Dr.) Aditi Dasgupta*

Page: 40

## **From Inner Governance To Institutional Governance – Operationalising ESG: An India–Global Dialogue | Part VII**

The Next Frontier: AI, Climate Finance and Regulatory Convergence

*CMA (Dr.) Aditi Dasgupta*

Page: 45

## **Beyond The Balance Sheet – Ethics & Governance In Business | Part VIII**

Governance and its oversight on management

*Usha Ganapathy Subramanian*

Page: 48

## **Sustainability In Numbers: From Metrics To Management | Ep: V**

ESG Dashboards – Turning Data into Decisions

*CMA (Dr.) Aditi Dasgupta*

Page: 50

## **Earth's Hidden Connections | Series X**

The Science of Interdependence: How Life Sustains Life and Builds a Sustainable Earth

*CMA Arunabha Saba*

Page: 56

## **Mandala & Sustainability**

Ganesh Chaturthi: A Journey from Inner Obstacles to Emotional Healing

*Geeta Joshi Brahme*

Page: 61

## **Vruksh Series**

Jyeshtha Nakshatra

*Purvi Dalal*

Page: 63

## **Do You Know?**

Page: 64

## **Sustainability Quiz-Rapid Fire Round**

Page: 65



## Sunita Narain

A Voice for Environmental Justice, Sustainable Development and Climate Responsibility

The Sustainability Standards Board (SSB) of the Institute of Cost Accountants of India (ICMAI) proudly salutes Sunita Narain, one of India's most influential environmentalists and a powerful voice for sustainable development, environmental justice and responsible public policy - for making environmental responsibility, climate justice and sustainable development an essential part of India's development conversation. Her journey represents the power of knowledge, evidence, advocacy and public policy to transform the sustainability discourse.

As the Director General of the Centre for Science and Environment (CSE) and editor of Down To Earth, Sunita Narain has spent decades demonstrating that environmental sustainability cannot be separated from development, equity, livelihoods and social justice. Her work has consistently challenged conventional approaches to environmental protection and placed people, communities and ecological sustainability at the centre of the development discourse.

Her contribution spans some of the most pressing environmental challenges confronting India and the world—air pollution, climate change, water security, sustainable urban development and natural-resource management. Her leadership in the campaign for Compressed Natural Gas (CNG) in Delhi's public transport system demonstrated how sustained environmental advocacy can translate into meaningful policy intervention. Her pioneering work on rainwater harvesting and community-based water management, along with CSE's landmark Excreta Matters initiative, has highlighted the critical connections between water, sanitation, public health and urban sustainability.

A defining dimension of Sunita Narain's work has been her advocacy for climate justice. She has consistently emphasised that climate change is not merely an environmental or technological challenge, but also a question of equity, historical responsibility, resource distribution and the right to development. Her voice has been particularly significant in articulating the concerns of developing countries and communities that remain highly vulnerable to climate impacts despite having contributed relatively little to historical emissions.

Her contributions have earned wide national and international recognition. She was awarded the Padma Shri in 2005 and, under her leadership, the Centre for Science and Environment received the Stockholm Water Prize. In 2016, Time magazine included her among the 100 Most Influential People in the world, and she received the Edinburgh Medal in 2020 for her contribution to science and society. Her influence has also extended into public policy through her association with the Prime Minister's Council on Climate Change and her chairmanship of the Tiger Task Force constituted following the Sariska tiger crisis.

For the sustainability and ESG community, her journey carries a particularly powerful message: sustainability is much more than environmental compliance. It requires organisations to understand and take responsibility for their impacts on natural resources, communities and future generations. It calls for transparency, accountability and responsible decision-making, while recognising that environmental and social risks can ultimately become economic and financial risks.

At a time when businesses are increasingly expected to measure, manage and disclose their sustainability impacts, Sunita Narain's work reminds us that the essence of sustainability lies beyond reporting frameworks and regulatory requirements. It lies in questioning unsustainable practices, influencing policy, empowering communities and creating accountability for the choices made today.



## SUSTAINABILITY -GLOBAL CONTEXT

### Monthly News

#### 1. France Cuts \$580 Million from Green Homes Fund

France will cut approximately \$580 million from the agency responsible for distributing home energy renovation subsidies in 2026. The decision raises questions about whether the government can meet its target of renovating 700,000 homes annually by 2030. The draft 2026 Finance Bill reduces payment credits for the National Housing Agency, known as ANAH, to about \$1.73 billion. The agency received approximately \$2.31 billion in 2025.

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#### 2. EU Lawmaker Pushes More ETS Revenue into Industry

European Union governments could be required to channel substantially more carbon market revenue into domestic industrial decarbonisation under a proposal from a key European Parliament negotiator. the Parliament's lead negotiator on reforms to the EU Emissions Trading System, has proposed that governments direct 75% of their ETS revenues toward industries covered by the scheme. That is significantly higher than the 50% level proposed by the European Commission.

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#### 3. EU Backs More Free CO<sub>2</sub> Permits for Heavy Industry

European Union countries have backed plans to give heavy industries more free carbon permits through 2030, offering billions of dollars in potential relief from emissions costs. The proposal would add 121 million free CO<sub>2</sub> allowances between 2026 and 2030. The permits would be allocated based on companies' heat production and fuel use. The additional allowances could save affected companies about \$9.52 billion in carbon costs, according to Reuters calculations. They would also provide industry with more free permits than the European Commission originally proposed.

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#### 4. Trump EPA Repeals Power Plant Carbon Rules

The U.S. Environmental Protection Agency has repealed most Biden-era greenhouse gas requirements for fossil fuel power plants, reshaping federal climate regulation of the electricity sector. EPA Administrator announced the decision at a G20 energy ministers meeting in Houston. The agency also proposed removing all remaining federal greenhouse gas standards for power plants. The finalized action targets key parts of the 2024 Carbon Pollution Standards. Those rules established emissions requirements for existing fossil fuel plants and new or modified facilities. They also relied on technologies including carbon capture and storage to reduce emissions.

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#### 5. EU Parliament Backs Expanded CBAM and Decarbonisation Fund

The European Parliament has backed a broader Carbon Border Adjustment Mechanism (CBAM), pushing the EU carbon levy deeper into industrial supply chains while tightening rules designed to prevent circumvention. Lawmakers adopted Parliament's negotiating position by 464 votes to 50, with 159 abstentions. The vote clears the way for negotiations with EU member states on the final legislation. The changes would extend CBAM beyond basic materials to a wider range of downstream products. Finished steel and aluminium goods, including fasteners, wire, springs and household articles, would come within its scope.

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#### 6. Climate Pledge Firms Cut Operational Emissions 11%

Seven years after The Climate Pledge launched, its corporate membership is expanding while reported emissions data points to faster decarbonization among participating companies than their industry peers. The 2026 Climate Pledge Report covers more



Image by Canva

than 700 signatories spanning 62 industries and 49 countries and territories. Together, those businesses generate \$3.8 trillion in annual revenue, giving the initiative significant purchasing power across energy, transport, construction and industrial supply chains.

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## 7. UK Proposes Cutting Mandatory ESG Disclosures

The UK government has opened a sweeping consultation that could recast how companies report environmental, social and governance matters under the Companies Act 2006. Published on 7 September, the plan seeks to refocus annual reports on financially material, decision-useful information for investors and creditors. Ministers argue that years of added requirements have produced long, complex reports, duplicated obligations and higher compliance costs.

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## 8. World Bank Backs \$2.86B Brazil Industry Decarbonisation

The World Bank Group is backing a \$2.86 billion financing effort to decarbonize Brazil's energy-intensive industries, including steel, cement, chemicals and aluminum. The package combines \$1.06 billion in World Bank and Clean Technology Fund loans with an expected \$1.8 billion in additional development and commercial financing. Brazil aims to cut the greenhouse gas intensity of industrial GDP

by 30% by 2033 while building competitive markets for low-carbon fuels and industrial materials.

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## 9. Canada Backs \$70B Clean Power Buildout

Canada will provide \$7.2 billion in federal financing for major hydroelectric, wind and transmission projects spanning Newfoundland and Labrador and Québec. The wider investment is valued at nearly \$50.7 billion, with projects expected to deliver 14,000 MW of renewable power and support 23,000 jobs. The buildout links clean power with critical minerals strategy, including new infrastructure for iron ore, graphite and mine electrification in the Labrador Trough.

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## 10. UN Finds 15-to-1 Return on Clean Air and Climate

The UN Environment Programme and Climate and Clean Air Coalition examined 25 proven measures across six major economic sectors. The package includes renewable power, electric vehicles, clean cooking, energy efficiency and controls on methane leaks. The assessment found that governments gain more by tackling climate change and air pollution together. Many of the same industries, fuels and pollutants drive both crises.

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# SUSTAINABILITY -INDIAN CONTEXT

## Monthly News

### 1. India Inc's ESG Policies Outpace Execution: IIM Bangalore Study of 982 Firms Finds Deep Gaps

A new IIM Bangalore study of BRSR disclosures from 982 listed companies finds India Inc has embraced ESG policy frameworks on paper, but execution lags sharply — emissions are rising, renewable energy adoption remains negligible, and gaps persist in worker welfare, water management and board diversity.

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### 2. UK Recognises India's Carbon Credit Scheme Under CBAM, Easing Exporter Burden

The United Kingdom has recognised India's Carbon Credit Trading Scheme (CCTS) as a qualifying carbon pricing mechanism under its Carbon Border Adjustment Mechanism (CBAM). This move could reduce the carbon-related financial burden on Indian exporters to the UK. According to PTI, the recognition means UK importers of eligible Indian goods covered by the UK CBAM may seek relief for the effective carbon price already paid on those goods under India's CCTS. The relief will be subject to the evidence and verification requirements prescribed under UK law.

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### 3. India Boosts Sustainable Farming as Food Grain Output Hits 358M Tonnes

India has expanded program supporting sustainable agriculture across millions of hectares as food grain production reached a record 357.73 million tonnes in 2024-25, the government said. The government outlined the progress in a written reply to Parliament on Aug. 11, citing programs covering soil health, micro-irrigation, organic farming, natural farming, agroforestry and water conservation. Food grain

production rose from 252.03 million tonnes in 2014-15 to 357.73 million tonnes in 2024-25. Horticulture production increased from 280.98 million tonnes to 370.73 million tonnes during the same period. The government said its sustainable farming programs seek to improve resource efficiency and climate resilience while supporting agricultural production.

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### 4. Supreme Court Directs DDA to Refund ₹5 Crore

National Green Tribunal (NGT) and directed the Delhi Development Authority (DDA) to refund the ₹5 crore environmental compensation deposited by Sri Sri Ravi Shankar's Art of Living Foundation within four weeks. The judgment, delivered by a bench comprising Justices Satish Chandra Sharma and N. Kotiswar Singh, concludes a multi-year legal battle over the three-day World Culture Festival held on the Yamuna floodplains in March 2016.

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### 5. Coal India Limited announces ambitious Business Development portfolio for diversification beyond mining

Coal India Limited announced its ambitious business development portfolio on Sunday. This plan focuses on five key platforms for future expansion and growth. Initiatives include coal gasification, thermal power, and renewable energy ventures. The company will also explore critical minerals and advanced materials. This diversification aims for energy and mineral security and import substitution.

[READ MORE](#)

### 6. India weighs green finance label for nuclear as private entry nears

India is weighing whether nuclear power should be treated as green, a move that could open the door to





Source: Conceptualised &amp; designed AI tools

cheaper borrowing and climate finance. The power ministry's request comes as the government finalises the SHANTI Act framework for private participation in civil nuclear generation.

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### 7. India approves export of power to Nepal after deadly flood

[READ MORE](#)

India has approved export of power to Nepal for 18 hours a day until December 31 after a devastating flood in the Himalayan nation last month wiped out about a tenth of its generation capacity, neighbour India's power ministry.

[READ MORE](#)

### 8. PM Modi says India's per capita carbon emissions less than half of global average

Prime Minister Narendra Modi has said that India's contribution to per capita carbon emissions is less than half of the global average. Inaugurating the International Conference on the Future of Environment and Climate Dynamics in New Delhi today, Mr Modi said that developing countries have

often been unfairly held responsible for carbon emissions. He highlighted that India is the only country in the G-20 that has successfully fulfilled the commitments made at the COP-21 Summit in Paris ahead of schedule. The Prime Minister said, over the past twelve years, India has made extraordinary progress in every field related to the environment.

### 9. Permission granted to cut more than 156,000 sal trees in Madhya Pradesh

Permission has been granted to fell sal trees affected by the sal borer insect in the Amarkantak region of Dindori and Anuppur districts in Madhya Pradesh. Surendra Jatav, sub-divisional officer of the Dindori Forest Department, told that the central government had granted permission to fell 146,784 trees in Dindori district. The approval was granted a few days ago, he said, adding that felling of the affected trees would begin soon.

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# CONTINENT-WISE CORPORATE SUSTAINABILITY REPORTING FRAMEWORKS – MAPPING OF SDGS AND EVALUATION OF DIVERSITIES

## *Oceania: Climate Resilience, Indigenous Rights and Emerging Sustainability Reporting*

**CMA (Dr.) Aditi Dasgupta**  
Joint Director  
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### Abstract

Oceania presents a diverse sustainability reporting landscape shaped by climate resilience, indigenous rights, biodiversity, and natural-resource management. Australia and New Zealand have established structured, ISSB-aligned climate disclosure regimes, while Pacific Island nations rely more on community-based and resilience-focused approaches. Cost and Management Accountants support this transition by integrating ESG data, climate costs, risk assessment, and sustainability performance into financial and strategic decision-making.

### Key Point

Oceania combines mandatory climate reporting in Australia and New Zealand with community-based climate resilience in the Pacific Islands, while CMAs help translate sustainability risks and impacts into measurable costs, performance indicators, and long-term business value.

Oceania presents a distinctive sustainability reporting landscape shaped by climate vulnerability, environmental stewardship, indigenous rights, and the transition toward globally aligned sustainability standards. While Australia and New Zealand have developed relatively structured reporting regimes, many Pacific Island nations continue to rely on community-based and development-supported approaches. Across the region, sustainability reporting increasingly addresses climate-related risks, biodiversity, natural-resource management, indigenous participation, and long-term resilience.

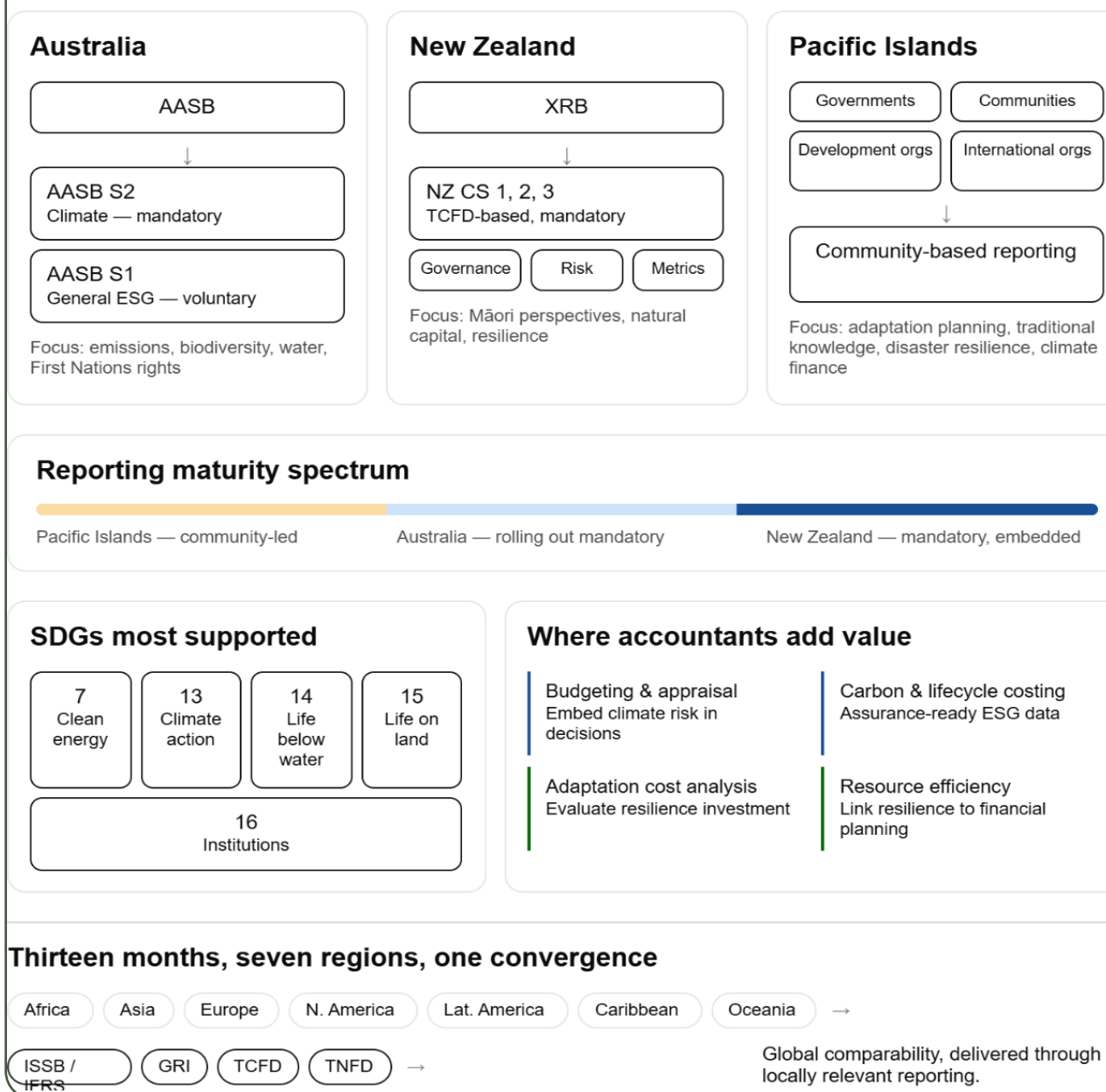
### **Australia – Transition to Mandatory Reporting**

Australia has emerged as a leading jurisdiction in the region for climate-related financial reporting. The

Australian Accounting Standards Board (AASB) has developed sustainability standards aligned with the ISSB framework. AASB S2 Climate-related Disclosures forms the basis of Australia's mandatory climate reporting regime for entities within its phased reporting requirements, while AASB S1 General Requirements for Disclosure of Sustainability-related Financial Information provides a broader sustainability disclosure framework on a voluntary basis.

Australian sustainability reporting increasingly focuses on climate transition, emissions reduction, biodiversity, water management, workforce issues, and the interests and rights of Aboriginal and Torres Strait Islander peoples. The country's resource-intensive economy also makes transparent reporting particularly important for mining, energy, agriculture, infrastructure, and financial services.

## Oceania: regulation meets resilience



Source: Conceptualised & designed by the author using AI tools

### New Zealand — Integrated Climate Disclosure Framework

New Zealand was an early adopter of mandatory climate-related disclosures. Its NZ CS 1, NZ CS 2 and NZ CS 3 standards, developed by the External Reporting Board (XRB), establish a framework based substantially on the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

The framework requires eligible organizations to report on climate-related risks and opportunities, governance, strategy, risk management, metrics, and

targets. Sustainability reporting in New Zealand also reflects the country's emphasis on indigenous Māori perspectives, natural capital, biodiversity, and climate resilience. This provides a broader context for understanding sustainability beyond purely financial considerations.

### Pacific Islands — Community-Based Climate Reporting

The Pacific Island nations represent a markedly different sustainability reporting environment. Many small island developing states face disproportionate exposure to sea-level rise, cyclones, coastal erosion,





biodiversity loss, and other climate-related risks, despite contributing relatively little to global emissions.

Consequently, sustainability reporting in the Pacific is often closely connected with community-based climate assessment, adaptation planning, indigenous and traditional knowledge, disaster resilience, and access to climate finance. Rather than relying exclusively on corporate reporting mandates, governments, communities, development institutions, and international organizations play an important role in collecting and communicating sustainability information.

## Evaluation of Diversities Across Oceania

Oceania demonstrates significant diversity in sustainability reporting maturity. Australia is moving toward comprehensive, regulated climate reporting through AASB S2, while New Zealand has already established mandatory climate-related disclosure standards. In contrast, Pacific Island countries generally employ more community-oriented and climate-resilience-focused approaches.

Despite these differences, the region shares several common priorities: climate resilience, biodiversity conservation, responsible resource management, indigenous rights, and sustainable economic development. The increasing alignment of Australia and New Zealand with ISSB-based standards also contributes to greater regional consistency and international comparability.

From an SDG perspective, sustainability reporting across Oceania particularly supports SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), SDG 14 (Life Below Water), SDG 15 (Life on Land), and SDG 16 (Peace, Justice and Strong Institutions).

## Role of Cost and Management Accountants

Cost and Management Accountants (CMAs) can play an important role in translating Oceania's sustainability objectives into measurable financial and operational outcomes. They can integrate climate risks and sustainability considerations into budgeting, investment appraisal, cost management, risk assessment, and performance measurement.

In Australia and New Zealand, CMAs can support organizations in preparing reliable, decision-useful ESG information under AASB and NZ sustainability reporting requirements. Their expertise in carbon costing, lifecycle costing, resource-efficiency analysis, emissions measurement, internal controls, and ESG data management can improve the credibility and assurance-readiness of sustainability disclosures.

In the Pacific Islands, CMAs can contribute by assessing the economic costs of climate risks, evaluating adaptation investments, measuring resource efficiency, and linking community resilience initiatives with financial planning. By connecting sustainability performance with financial decision-making, CMAs help organizations move beyond compliance toward resilient operations, responsible resource allocation, and long-term value creation.

## From Continental Diversity to Global Convergence

Over the past thirteen months, our journey through the Corporate Sustainability Reporting Frameworks across Africa, Asia, Europe, North America, Latin America, the Caribbean, and finally Oceania—Australia and the Pacific Islands has revealed one overarching reality: sustainability reporting is no longer a peripheral exercise in corporate disclosure; it is becoming an integral component of corporate accountability, governance and long-term value creation.

Each continent has approached sustainability reporting through the lens of its own economic priorities, environmental vulnerabilities, regulatory architecture, social realities and development needs. Europe has demonstrated strong regulatory standardisation; North America has increasingly focused on investor-relevant climate and sustainability information; Asia has witnessed rapid regulatory development alongside diverse emerging-market contexts; Africa has highlighted the importance of development, natural resources and social inclusion; while Latin America and the Caribbean have increasingly connected sustainability reporting with climate resilience, biodiversity and social equity.

Our final destination, Oceania, brings another important dimension to this global picture. Australia is moving towards mandatory climate-related financial disclosure, while New Zealand has already developed mandatory climate standards. At the same time, the Pacific Island nations remind us that sustainability is not simply about reporting corporate impacts—it is also about survival, resilience, indigenous knowledge, community well-being and climate justice.

The thirteen-month journey therefore demonstrates that there is no single universal pathway to sustainability reporting. Yet, there is a clear movement towards greater global comparability and convergence, driven by frameworks and standards such as ISSB/IFRS Sustainability Standards, GRI, TCFD, TNFD, and regional regulatory requirements.

The future of sustainability reporting will consequently depend not merely on what companies disclose, but on how credible, comparable, decision-useful and connected that information is with strategy, risk management, financial performance and stakeholder impact.

## The Larger Takeaway

From Africa to Oceania, the message is clear: sustainability reporting is evolving from disclosure to accountability, from compliance to strategy, and from

isolated ESG metrics to an integrated understanding of corporate value and societal impact. As we close this thirteen-month continental journey, one principle stands out: global sustainability may require common standards, but meaningful sustainability reporting must remain sensitive to local realities.



The next chapter, therefore, is not about another continent. It is about convergence—and about how businesses, regulators, investors and professionals can translate this increasingly interconnected reporting landscape into credible information, responsible decisions and sustainable value creation. The journey across continents ends here; the journey towards globally comparable, credible and impact-oriented sustainability reporting has only begun. **SB**

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# TAXONOMY – DEFINING WHAT IS SUSTAINABLE

**Usha Ganapathy Subramanian**  
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Part: VIII

## Abstract

Before one can answer “Is this a green bond?”, we need to ask “What is green?”. The answer is given by a taxonomy for sustainable activities – a system to define what constitutes a sustainable activity, identify various categories of such activities and possibly, to evolve standards and methods to fit the proposed sustainable activities in the categories. The aim here is to reduce the scope for differing interpretations and to promote uniform understanding of what is a sustainable activity. This, when well-integrated with the financial regulatory environment, ensures investors can credibly invest in sustainability-labelled instruments and funds flow towards activities that are actually sustainable. Jurisdictions across the world are at various stages of evolving and implementing such taxonomies. The EU already has in place a detailed taxonomy regulation, while India is in the process of developing one.

## Introduction

We have spent the last few editions discussing green bonds, transition finance and sustainability-linked finance. But there is a fundamental question underlying all of these instruments: what exactly qualifies as green or sustainable? After all, if everyone is free to decide what is green, how can investors distinguish genuine sustainable finance from greenwashing? This is where the concept of a taxonomy assumes significance.

## What is a taxonomy?

Taxonomy generally refers to standardizing classification and categorization of things. In the world of sustainable finance, taxonomy refers to a classification system for economic activities to qualify as sustainable. This matters for sustainable finance because it involves redirection of real resources towards activities that the investors believe to be sustainable. This is more so given the greenium advantage that sustainable finance products sometimes enjoy, that is, attracting a premium pricing as investors are often willing to pay more or accept lower yields. Regulators around the world are trying to evolve or adopt taxonomies. This ensures that the terms like green or sustainable are not rendered malleable to greenwashing, and there is less room for interpretation and grey areas. A system of

taxonomy provides a standard language, bringing uniformity to this new realm of finance. Taxonomy classifies economic activities; financial instruments can then use that classification to determine what they may finance.

Jurisdictions across the world are exploring ways to integrate taxonomy into their regulatory ecosystem. For instance, the European Union (the EU) has developed a detailed taxonomy, which forms the basis of its voluntary European Green Bond (EuGB) framework.

## EU Taxonomy

EU's action plan on financing sustainable growth<sup>1</sup> laid down the basis for the EU taxonomy as a classification system for sustainable activities. In July 2020, the EU Taxonomy Regulation entered into force. It sets out four conditions that an economic activity has to satisfy to qualify as ‘environmentally sustainable’, which are as follows:

- It contributes substantially to one or more environmental objectives as set out in the Regulations
- It does not significantly harm any of the environmental objectives (the do-no-significant-harm rule)

<sup>1</sup> [https://finance.ec.europa.eu/publications/renewed-sustainable-finance-strategy-and-implementation-action-plan-financing-sustainable-growth\\_en](https://finance.ec.europa.eu/publications/renewed-sustainable-finance-strategy-and-implementation-action-plan-financing-sustainable-growth_en)



- It is carried out with minimum safeguards as given in the regulations
- It complies with technical screening criteria that are established by the European Commission

There are six environmental objectives given under the Regulations: climate change mitigation, climate change adaptation, sustainable use and protection of water, circular economy, pollution prevention and control, and protection of biodiversity.<sup>2</sup> Technical screening criteria for each of these environmental objectives are laid down through delegated and implementing acts. Member States of the EU are required to establish measures and “effective, proportionate and dissuasive” penalties applicable to infringements of the requirements.



## India

In India, the Union Budget 2024-25 paved the way for introduction of a climate finance taxonomy.<sup>3</sup> On May 7, 2025, the Department of Economic Affairs under the Ministry of Finance released the draft framework of India's climate finance taxonomy, inviting public comments.<sup>4</sup> The objectives are to facilitate greater fund inflows to sustainable activities, to prevent greenwashing, supporting Viksit Bharat, and including activities aimed at mitigation, adaptation and specifically, transition of hard-to-abate sectors.

The framework proposes a hybrid approach combining both qualitative and quantitative aspects. It mentions eight principles – consistency with stated position on climate action, focusing on pathways in country context, interoperability with other taxonomies, supporting transition, promoting indigenous technologies, being science-based and transparent, considering proportionality for MSMEs, do-no-significant-harm to other objectives. The approach is to categorise activities into climate supportive (further divided into tier 1 and tier 2) and transition supportive.

The paper proposes a graded approach for classifying activities. In order to be classified as ‘climate supportive’, the activities must contribute to at least one of the following: avoiding GHG emissions, reducing emission intensity, deploying adaptation

solutions to counter climate change, or research and development towards the above.

To begin with, the framework shall cover only specified sectors like: power, mobility, buildings for mitigation and adaptation; agriculture, food and water security for adaptation and resilience building, and hard-to-abate sectors, especially iron and steel and cement, for transition. The Climate finance taxonomy framework will be supported by sectoral annexures to be developed.

While the framework is in contemplation, what fills the gap for now are the definitions embedded in existing sustainable finance regulations, and the guidelines that accompany them. For instance, in India, the SEBI (Issue and Listing of Non-Convertible Securities) Regulations, 2021 provides the definition for terms like ‘ESG Debt Securities’ and ‘Green Debt Securities’. Further, SEBI's 2023 circular provides for Dos and Don'ts for the issuers of these securities to prevent greenwashing.<sup>5</sup> It specifically mentions that the issuers should quantify externalities, should avoid cherry-picking data to highlight green practices while obscuring unfavourable practices, and that the issuers should not use the funds for purposes other than those falling under the ‘green debt security’ definition. SEBI's existing framework already contains safeguards against greenwashing, even though India is still developing its formal taxonomy.

## Conclusion

It must be remembered that taxonomy, by itself, does not make an activity or an investment sustainable and does not guarantee prevention of greenwashing. It is only a common language for the world of sustainable finance. Its effectiveness depends on the enforcement mechanisms surrounding the taxonomy – the way in which it is adopted and embedded in the regulatory environment, the way in which a system of checks and balances are enforced – whether through third-party certifications or assurance or assessment exercises, and how the penal consequences for contravention are designed and enforced. However, what taxonomy does is to provide a base for setting expectations and standards against which the actuals are compared and evaluated. Only if what is expected is defined well, can there be any meaningful enforcement.

In the future editions, we will continue to discuss other topics in sustainable finance. **SB**

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<sup>2</sup> [https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities\\_en](https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en)

<sup>3</sup> <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2127562&reg=48&lang=2>

<sup>4</sup> <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/may/doc202557551101.pdf>

<sup>5</sup> [https://www.sebi.gov.in/legal/circulars/feb-2023/dos-and-don-ts-relating-to-green-debt-securities-to-avoid-occurrences-of-greenwashing\\_67828.html](https://www.sebi.gov.in/legal/circulars/feb-2023/dos-and-don-ts-relating-to-green-debt-securities-to-avoid-occurrences-of-greenwashing_67828.html)

# ECONOMICS OF ARTIFICIAL INTELLIGENCE: REDEFINING PRODUCTIVITY, EMPLOYMENT AND GROWTH

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Insight - IV

## Abstract

Artificial Intelligence (AI) is rapidly transforming the global economy by changing the way businesses operate, governments make decisions and people work and live. This article examines the impact of AI on key areas of economics, including productivity, employment, business, agriculture, infrastructure, human development and environmental sustainability. It explains how AI improves efficiency, promotes innovation, creates new economic opportunities and supports sustainable growth while also highlighting the need for responsible use, ethical governance and continuous reskilling. The article concludes that AI is not a replacement for human intelligence but a powerful tool that, when used wisely, can accelerate economic development, improve living standards and build a more inclusive, competitive and resilient economy.

## Introduction

AI is a computer technology that enables machines to think, learn and solve problems in the way humans do. It helps computers to analyse data, identify patterns and make decisions with less human involvement. However, reduction in human involvement is not always good or bad. It has both advantages and disadvantages.

### In favour:

- Faster decision-making.
- Higher efficiency and productivity.
- Reduces repetitive manual work.
- Can improve accuracy by reducing human errors.
- Operates continuously without fatigue.

### Against:

- May reduce human oversight in important decisions.
- Errors or bias in AI can affect many decisions if left unchecked.
- Can lead to overdependence on technology.

- May replace certain jobs or requiring workers to learn new skills.
- Lacks human judgment, ethics and emotional understanding in complex situations.

Nevertheless, the above-mentioned points clearly indicate that AI is intended to assist humans rather than replace them. This balanced approach will be appropriate, if it is used responsibly, ethically and in an unbiased manner.

## Improvement in core economic areas by the influenced of AI

### Productivity

AI can help to increase production/ productivity by atomising routine & repetitive tasks, optimising manufacturing processes and improving resource allocation. By increasing productivity, the cost of production will reduce without compromising the product quality. Which will ultimately support the economic growth through more efficient use of labour, capital and technology.





### Performance and Development

AI can improve overall economic performance by creating new high-skilled jobs, supporting entrepreneurship, improving job matching and opening opportunities in emerging industries. It promotes economic growth, encourages inclusive development, supports fairer income distribution, helps reduce poverty by improving livelihoods and expanding access to economic opportunities, strengthens price stability, enhances public finance and monetary policy and improves the efficiency and global competitiveness of international trade. At the same time, it increases the need for continuous reskilling and upskilling of the workforce.

### Employment

The impact of AI on employment is one of the most discussed topics today. While AI may automate some routine and repetitive jobs in the short term, it is also creating many new opportunities in the long term. Like every major technological revolution, AI is changing the nature of work rather than eliminating work itself.

History shows that new technology creates new careers. Computers replaced many manual tasks but also created professions such as software development, cybersecurity, digital marketing and IT services. Similarly, AI is creating opportunities in data science, machine learning, robotics, AI system management and intelligent automation. At the same time, AI helps businesses become more productive, expand their operations and generate additional employment.

One of the biggest advantages of AI is that it is breaking the traditional boundary between functional and technical professions. Earlier, professionals such

as accountants, doctors, engineers, HR managers and lawyers depended on IT specialists to develop software or automate their work. Today, with user-friendly AI tools and low-code/no-code platforms, they can build reports, automate routine tasks, develop simple applications and create solutions specific to their own profession. For example, an accountant can now develop a costing system, automate financial reports or create dashboards without being an expert programmer. This enables professionals to provide complete end-to-end business solutions instead of only functional advice.

At the same time, IT professionals are not losing opportunities; instead, they are moving towards more advanced and higher-value roles such as AI development, machine learning, cloud computing, cybersecurity, intelligent automation and digital transformation. Thus, AI is not replacing people—it is upgrading their skills, improving productivity and creating better career opportunities. The key to benefiting from AI is continuous learning, reskilling and adapting to new technologies.

### Business and Industrial Economics

AI is transforming business and industrial economics by making industries more efficient, competitive and innovative. It helps manufacturers improve product quality, reduce production costs, minimise wastage and increase productivity through smart automation and better planning. AI also strengthens supply chain management by accurately forecasting demand, optimising inventory and ensuring timely delivery of materials and finished goods.

AI encourages innovation by helping businesses develop new products and services more quickly. It supports entrepreneurs and MSMEs by providing affordable tools for accounting, marketing, customer





service, inventory management and business analysis, enabling small businesses to compete with larger organisations. AI also improves investment decisions by analysing market trends and business risks, helping companies make better use of capital. In addition, AI strengthens corporate governance through better compliance, fraud detection, risk management and transparent reporting, while enabling investors and financial markets to make faster and more informed decisions.

### Infrastructure and Technology

AI is accelerating infrastructure and technological development by making transport, energy, communication and digital services more efficient and reliable. It supports smart traffic management, optimises energy generation and distribution, improves public infrastructure planning and promotes the growth of the digital economy. AI is the driving force behind Industry 4.0, enabling smart factories, intelligent automation and connected systems that improve productivity and quality.

AI also contributes to the development of smart cities through intelligent traffic control, waste management, water supply and public safety systems. It strengthens the cyber economy by improving cybersecurity, detecting fraud and protecting digital assets. At the same time, AI promotes innovation by encouraging research, collaboration and knowledge sharing, leading to a knowledge-based economy where data, technology and skilled human capital become the key drivers of sustainable economic growth. For example, AI-powered smart traffic signals reduce congestion, while smart electricity grids minimise power losses and ensure efficient energy distribution.

### Agriculture and Food

AI is transforming agriculture by improving farm productivity, ensuring food security and making farming more efficient and sustainable. It helps farmers monitor crop health, predict weather conditions, optimise irrigation, detect pests and diseases early and use fertilisers more effectively through precision agriculture. AI also strengthens agricultural supply chains by improving demand forecasting, reducing post-harvest losses and ensuring timely delivery of agricultural produce.

AI supports climate-resilient farming by helping farmers adapt to changing weather patterns and make better cropping decisions. It also improves access to agricultural finance by enabling faster credit assessment, crop insurance and digital financial services for farmers. For example, AI-based sensors and drones can identify diseases in crops at an early stage, while weather forecasting systems help farmers decide the best time for sowing, irrigation and harvesting, leading to higher yields and better incomes.

### Human and Social Development

AI is improving human and social development by making education, healthcare and public services more accessible, efficient and inclusive. It supports personalised learning, early disease detection, telemedicine and skill development, helping build a stronger and more productive workforce. AI also promotes gender equality, social inclusion and digital inclusion by expanding access to information, education, financial services and employment opportunities for people from all sections of society.

AI assists governments in planning for population growth, migration and urban and rural development through data-driven decision-making. It helps improve infrastructure, public services and resource allocation, leading to a better quality of life. For example, AI-powered online education enables students in remote villages to access quality learning, while telemedicine connects rural patients with specialist doctors, reducing the gap between urban and rural areas.

### Environment and Sustainability

AI is playing a vital role in protecting the environment and promoting sustainable development. It helps monitor climate change, reduce carbon emissions, improve the efficient use of natural resources, support renewable energy, strengthen circular economy practices, conserve biodiversity and manage water resources more effectively. AI also assists governments and businesses in developing green finance initiatives, carbon markets and sustainable agricultural practices through better data analysis and informed decision-making.

For example, AI-powered smart grids optimise the generation and distribution of solar and wind energy, reducing energy wastage. AI-enabled satellite images and drones help monitor forests, wildlife and biodiversity, enabling early detection of illegal deforestation and forest fires. Similarly, AI-based irrigation systems analyse soil moisture and weather conditions to supply only the required amount of water, conserving water resources while improving agricultural productivity.

The discussion above clearly shows that the influence of AI is not confined to any one sector of the economy. From improving productivity and employment to strengthening businesses, infrastructure, agriculture, human development and environmental sustainability, AI is transforming almost every aspect of economic activity. Although its adoption presents certain challenges, particularly in terms of workforce transition and ethical use, its long-term economic benefits are far greater when supported by responsible governance, continuous innovation and skill development. This holistic impact of AI on the economy can be summarised as follows:

### AI as a Catalyst for Economic Development and Modern Progress:

AI is no longer just a technological innovation; it has become a powerful driver of economic development and social progress. By improving productivity, encouraging innovation, strengthening industries, modernising agriculture, enhancing infrastructure and making education and healthcare more

accessible, AI contributes to higher economic output and a better quality of life. It enables businesses to produce more with fewer resources, improves the utilisation of labour and capital, supports entrepreneurship and enhances the competitiveness of industries in both domestic and global markets.

At the macroeconomic level, AI promotes sustainable economic growth by improving resource allocation, reducing production costs, increasing efficiency and supporting informed policy decisions. It strengthens human capital through continuous learning and skill development, encourages investment, accelerates digital transformation and creates new avenues for employment and income generation. AI also supports environmental sustainability by promoting renewable energy, efficient resource management and climate-resilient development, ensuring that economic progress is balanced with environmental responsibility.

In the modern economy, the true strength of AI lies not in replacing human intelligence but in enhancing it. When used responsibly and ethically, AI acts as a catalyst for innovation, productivity and inclusive growth. It empowers individuals, businesses and governments to make better decisions, improve living standards, reduce economic inequalities and build a more resilient, competitive and knowledge-driven economy. As nations embrace AI with the right policies, governance and skill development, it has the potential to become one of the most significant engines of sustainable economic prosperity in the twenty-first century.

### Conclusion

AI is not just transforming technology; it is transforming economies. By improving productivity, creating new employment opportunities, encouraging innovation, strengthening businesses and supporting sustainable development, AI is becoming a key driver of economic growth and national prosperity. The real opportunity lies not in replacing human intelligence but in combining it with AI to achieve better outcomes.

As the saying goes, “AI will not replace people; people who know how to use AI will replace those who do not.” This highlights the importance of continuous learning and adapting to new technologies. Equally relevant is the thought, “Technology is most powerful when it empowers people.”

When used responsibly, ethically and inclusively, AI can become one of the greatest engines of productivity, innovation and sustainable economic development. The future belongs to economies that successfully combine human intelligence with AI to create shared prosperity and a better quality of life for all. **SB**



# NEPAL'S LOST YEARS, AND WHY INDIAN CAPITAL SHOULD CARE

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## Abstract

Nepal will finish the 2030 Agenda having had roughly eleven usable implementation years out of fifteen. Earthquakes, a pandemic, floods and a demanding federal transition consumed the rest. This article maps five successive shocks onto specific Sustainable Development Goals, examines why the National Planning Commission records only 41.7 per cent progress against 2030 targets, and asks what four remaining years can deliver against an annual investment requirement of USD 23 billion set beside a federal budget of USD 14 billion. It argues that Nepal is weakest on precisely the goal whose achievement would help finance the others, and that the circular economy remains uncoded because material flows go unmeasured. For Indian finance professionals, the exposure is direct: Indian enterprises hold a hydropower pipeline in Nepal larger than the country's entire installed capacity.

## The exposure is already on Indian books

On the morning of 26<sup>th</sup> August 2026, a glacier-triggered flood swept seventy-two kilometres of the Trishuli River. Nepal's National Disaster Risk Reduction and Management Authority has confirmed 1,287 dead and more than 5,000 missing, with nearly 1.6 million people affected. Fourteen hydropower projects were damaged, taking roughly 748 MW off a grid that had only recently made Nepal a net electricity exporter.

For Indian readers, this is not a distant humanitarian story. Roughly half of Nepal's foreign hydropower investment is Indian. SJVN is advancing 2,069 MW across three projects, NHPC 1,824 MW across three more, and GMR is developing the 900 MW Upper Karnali. Seven Indian projects total 4,783 MW, which exceeds everything Nepal has built in 113 years of electricity generation. Arun-3 alone carries a cost of about USD 1.04 billion.

Himalayan hydrology is therefore an impairment question sitting on the balance sheets of listed Indian enterprises. Understanding why Nepal keeps losing

development ground is, for our profession, a matter of provisioning and disclosure rather than sympathy.

## Five shocks, and what each one undid

Nepal's difficulty is not that disasters occur. It is that each arrives before recovery from the last is complete, so gains are booked and written off within the same reporting cycle.

The 2015 Gorkha earthquake killed 8,979 people and produced damages and losses of USD 7.06 billion, equivalent to about 36 per cent of GDP. The reconstruction lesson matters more than the headline. Homeowner grants of NPR 300,000, paid in three tranches, fell short of rebuild costs, so households borrowed. A housing shock became a household-debt shock, and progress on Goal 11 was converted into pressure on Goal 1.

COVID-19 followed. The National Planning Commission's own Voluntary National Review records that around four per cent of the population fell back into extreme poverty during the pandemic. That is the government stating, in its own review, that



a decade of Goal 1 progress was partially reversed in three years.

The November 2023 Jajarkot earthquake damaged 28,769 houses in Karnali, among Nepal's poorest provinces, with recovery costed at USD 518 million. The September 2024 floods produced the heaviest Kathmandu Valley rainfall on record since 1970. The NDRRMA assessed total loss at NPR 46.68 billion, including 41 road sections at NPR 27.98 billion and 1,678 water and sanitation systems at NPR 5.91 billion. Some 65,380 hectares of farmland were affected, with paddy on 58,476 hectares destroyed outright.

Read as a sequence, these events touch Goals 1, 2, 6, 9, 11, 13 and 15 in turn. The 2024 floods alone damaged water systems serving communities whose access had been counted as a Goal 6 achievement the previous year.

One detail deserves particular attention from finance professionals. The initial official estimate of 2024 flood losses was around NPR 17 billion. The assessed figure came in at NPR 46.68 billion, nearly three times higher. A country that misestimates its losses by that margin cannot price risk transfer, which is why almost none of it is insured.

## Why the years ran out

The 2030 Agenda runs from 2016. Approximately ten and a half years have elapsed. If four to five were lost to the pandemic, the disaster sequence and governance disruption, Nepal has had something like six effective implementation years so far. Four remain. Even if all four are used well, the country will reach 2030 having had eleven usable years out of fifteen.

Governance accounts for much of the loss. Nepal adopted a new constitution in 2015 and restructured into seven provinces and 753 local governments, each requiring fiscal and administrative capacity built from nothing. Multiple changes of federal government followed. Capital budget under-execution is the measurable symptom, and it is the reason allocations do not become outcomes.

The results are visible in the Voluntary National Review of June 2024, which assessed 238 of 301 indicators. National average progress reached 58.6 per cent against 2022 milestones but only 41.7 per cent against 2030 targets. At the pace observed between 2016 and 2022, Nepal projects attainment of 60.5 per cent by 2030. Measured differently, 41 per cent of indicators exceeded their 2022 targets, 35 per cent progressed, 20 per cent regressed and 3 per cent were unchanged.

The regressions identify where the shocks bit. Anaemia affects 34 per cent of women of reproductive

age and 43 per cent of children under five. Tuberculosis incidence rose to 126 per 100,000 against a target of 67. Suicide mortality reached 23.4 per 100,000. Family planning needs met with modern methods fell from 66 per cent in 2015 to 55.1 per cent in 2022.

Set that against genuine achievement. Maternal mortality fell from 258 per 100,000 live births in 2015 to 151 in 2022. Multidimensional poverty fell from 30.1 per cent in 2014 to 17.4 per cent in 2022. Social protection now covers 47 per cent of the population, ahead of target. Nepal is not a country that failed to try.



## Four years, and an arithmetic problem

Nepal's updated costing puts the investment requirement at USD 163 billion for 2024 to 2030, an annual average above USD 23 billion. The federal budget is roughly USD 14 billion. No plausible improvement in revenue mobilisation closes a gap of that shape.

The fiscal position constrains the response. Outstanding public debt reached NPR 2,927.90 billion in mid-July 2026, or 45.07 per cent of GDP, and debt servicing absorbs a substantial share of the budget before development spending begins. Foreign exchange reserves look strong at 63.8 per cent of GDP and 19.6 months of import cover, but that buffer rests largely on remittances, which now approach a third of GDP. Nepal Rastra Bank's own macroeconomic reporting frames this as dependence rather than strength, tracing the rise from around 16 per cent of GDP in 2010/11 and observing that inflows substitute for an export base that has not developed. Manufacturing reached 5.3 per cent of GDP against a planned 6.5 per cent.

External financing is meanwhile tightening. Nepal was scheduled to graduate from Least Developed



Country status on 24 November 2026. On 13 May 2026 the government requested deferral to November 2029, citing regional conflict, loss of preferential market access, slow transition preparation and remittance risk. In July 2026 ECOSOC recommended that the General Assembly decide before the original graduation date. The matter is unresolved as this article goes to press, and either outcome carries cost: graduation removes trade preferences, while deferral signals to investors that a decade of preparation did not produce readiness.

Some instruments are in place. The Integrated National Financing Framework Financing Strategy 2025-2030 includes a climate and risk finance pillar with layered insurance pooling, and NIFRA has secured approval for Nepal's first public green bond. These are the right instruments. They are not yet at the scale the arithmetic demands.

### Risk that nobody has priced

The financing conversation usually concentrates on how much capital Nepal can raise. The prior question is how much of its existing loss it has transferred, and the answer is very little.

Consider what the absence of risk transfer does to a national balance sheet. Each major event lands directly on the exchequer and on household savings. Relief is funded by reallocating budget away from development programmes, which is the mechanism by which a flood becomes an SDG reversal rather than merely a humanitarian emergency. The 2015 earthquake produced losses equal to roughly a third of GDP; the 2024 floods removed NPR 46.68 billion; the 2026 flood is preliminarily assessed at NPR 387.54 billion. None of these were meaningfully insured. Each one therefore had to be absorbed twice, once as physical destruction and again as foregone development spending.

Three constraints hold this pattern in place, and each will be familiar to anyone who has worked on costing or risk. First, loss estimation is weak, and a near-threelfold revision between preliminary and assessed figures makes actuarial pricing impossible. Second, exposure data is thin: without asset registers and hazard mapping at municipal level, neither sovereign risk pools nor parametric instruments can be structured. Third, the premium has to be paid from a budget already committed, so risk transfer competes annually against visible development spending and losses.

The instruments themselves are not exotic. Sovereign parametric cover pays on a measured trigger rather than an assessed loss, which suits a country with weak assessment capacity. Contingent credit lines convert an unpredictable fiscal shock into a predictable financing cost. Layered structures, which the Integrated National Financing Framework already contemplates, retain frequent small losses domestically while ceding the tail. What is missing is not the product but the measurement and the accounting treatment that would let a finance ministry justify the premium.

For Indian enterprises holding Nepali hydropower assets, the same gap has a direct commercial reading. Where a host country cannot price catastrophe risk, that risk does not disappear. It is retained by whoever owns the asset.

### The goal that could pay for the others

Here the analysis turns. The Voluntary National Review names four goals requiring accelerated effort: Goals 8, 9, 12 and 16. Goal 12 is Responsible Consumption and Production, the circular economy goal.

Nepal is furthest behind on precisely the goal whose achievement would improve its capacity to fund the rest. Circularity is one of the few interventions that reduces cost and advances multiple goals simultaneously, which is what a country with four years and a nine-billion-dollar annual shortfall requires.

The material is available. The August 2026 flood alone left an estimated 2.2 million tonnes of debris, against reconstruction demand for aggregate. Kathmandu Valley generates about 1,200 tonnes of solid waste daily, nearly 70 per cent organic, almost all landfilled. Nepal has installed 449,338 domestic biogas plants, one of the more successful programmes of its kind anywhere, producing cooking energy and slurry that displaces imported fertiliser. Tourism has begun applying producer-responsibility logic: the Everest spring royalty rose from USD 11,000 to USD 15,000 in September 2025, with refundable garbage deposits following.

And yet the opportunity cannot be costed. Only 14 per cent of Nepali municipalities send any collected waste for recycling, and no official national recycling rate is published. There is no material flow account, no measured avoided-landfill cost, no valuation of recoverable aggregate against reconstruction demand.

This is the finding this article most wants to leave with its readers. Nepal's circular economy is not primarily blocked by policy or technology. It is blocked by the absence of measurement. A country that cannot quantify its material flows cannot build a business case, cannot attract private capital into recovery infrastructure, and cannot include circularity in its financing strategy in any form a lender would accept.

Measurement is our discipline. India's own progression demonstrates it: the Construction and Demolition Waste Rules, extended producer responsibility for plastics and the GOBARdhan programme all became investable once obligations were defined and flows were counted.

## What follows for the profession

Nepal will not close a USD 9 billion annual gap in four years. The useful question is what the remaining window can deliver.

Three priorities suggest themselves. Build on genuine momentum in energy, where progress has been strongest. Direct reconstruction through circular and resilient standards, since the material is already on the ground and will otherwise be landfilled at public cost. Treat disaster risk financing as the enabler it is, because a country that assesses losses at a third of

their eventual value and insures almost none of them will keep converting climate events into fiscal shocks.

For the Indian accounting and finance profession there are three specific implications. Indian enterprises hold nearly 4,800 MW of hydropower exposure in a jurisdiction where a single event removed 748 MW of capacity, which is a live question for impairment testing and climate-related disclosure. India's circular economy frameworks are directly transferable to a neighbour that has the policy intent and lacks the accounting infrastructure. And the measurement gap identified here is a professional services opportunity in a market where Indian capital is already the largest foreign investor.

Nepal has had six good years and has four left. What it does with them will be determined less by ambition, which is not lacking, than by whether the things that matter can be counted. **SB**

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# ESG AND SUSTAINABILITY: A SMART COMPARISON OF INDIA'S ESG ENVIRONMENT WITH EUROPEAN NATIONS

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**Abstract**

This paper presents a congenial view of India's ESG and sustainability environment with that of European nations. Europe demonstrates regulatory maturity through structured disclosure frameworks, climate accountability, value chain due diligence and investor-oriented transparency. India, follows a different path and is developing a pragmatic ESG model shaped by rapid growth, social inclusion, renewable energy expansion and national development priorities. The comparison shows that Europe is ahead in formal standards, assurance and regulatory discipline, while India's strength lies in scale, affordability, innovation and its ability to connect sustainability with inclusive economic transformation. India has its own major execution challenges, including population pressure, uneven infrastructure, limited ESG awareness, inadequate funding for smaller enterprises, data quality gaps, supplier readiness issues and regulatory complexity. These challenges make sustainability implementation more difficult than mere compliance reporting. My write up argues that India should not simply replicate Europe's model, but should learn from its transparency and governance discipline while designing a simpler, practical and locally workable ESG framework. A successful Indian ESG pathway must combine credible data, strong institutions, green finance, supplier capacity building, social impact and board-level accountability. The ultimate goal is to move from ESG compliance to ESG leadership through simplicity, agility and measurable impact.

**E**nvironmental, Social and Governance (ESG) has moved from being a voluntary corporate preference to becoming a decisive measure of business resilience, investor confidence, market access and long-term competitiveness. Across the world, sustainability is no longer treated as a decorative commitment; it is now a strategic operating language. India and European nations are both advancing rapidly in this direction, but they are doing so from different economic realities, regulatory philosophies and development priorities.

Europe is widely seen as a regulatory leader in ESG because of its detailed sustainability architecture, including the Corporate Sustainability Reporting Directive, European Sustainability Reporting Standards, EU Taxonomy and due diligence expectations. India, on the other hand, is building a practical and development-oriented ESG model through SEBI's Business Responsibility and

Sustainability Reporting framework, renewable energy expansion, climate commitments, corporate governance reforms and a strong push toward inclusive growth. The comparison is therefore not simply about which system is stricter; it is about how each region balances ambition, affordability, transparency and transformation.

## Executive Summary

India's ESG environment is evolving with speed, scale and pragmatism. It is shaped by a dual challenge: sustaining high economic growth while reducing environmental intensity and improving social outcomes. European nations operate in a more mature regulatory ecosystem where sustainability reporting, climate risk disclosure and value chain accountability are deeply embedded into corporate obligations. Europe leads in regulatory depth, assurance requirements and standardized disclosure,

while India leads in developmental relevance, renewable energy ambition and the ability to integrate sustainability with national growth priorities.

The strongest insight is that India should not merely copy Europe. India needs a smart ESG pathway that is globally credible but locally workable. European frameworks offer discipline, comparability and investor trust; India offers scale, innovation, cost-conscious implementation and social inclusion. The future of ESG will belong to companies and nations that combine both: European-level transparency with India-style agility.

### 1. Regulatory Approach: Compliance Depth versus Developmental Pragmatism

European nations have created one of the world's most comprehensive ESG regulatory ecosystems. The EU framework is built around mandatory sustainability reporting, double materiality, value chain disclosure and independent assurance. Companies are expected to explain not only how environmental and social issues affect their financial performance, but also how their operations affect people, communities and the planet. This gives investors and stakeholders a fuller picture of corporate responsibility.

India's ESG framework is more calibrated. The Business Responsibility and Sustainability Reporting framework applies to the top listed companies and is rooted in India's National Guidelines on Responsible Business Conduct. It covers environmental stewardship, employee welfare, human rights, community engagement, consumer responsibility and governance. Compared with Europe, India's framework is less complex but more accessible for companies operating in an emerging-market context.

The difference is clear: Europe uses ESG as a legal and financial transparency instrument, while India uses ESG as a responsible business transformation tool. Europe asks companies to prove sustainability in detail. India asks companies to begin measuring, improving and institutionalizing sustainability in a structured way. Both approaches are valuable, but their maturity levels differ.

### 2. Environmental Dimension: Climate Leadership, Energy Transition and Resource Reality

On the environmental front, Europe has set a high benchmark through climate neutrality goals, carbon pricing, taxonomy-aligned finance, circular economy policies and stricter climate disclosure. Many

European nations are further ahead in emissions measurement, green finance classification, waste management systems, energy efficiency and biodiversity-related reporting. The European model is highly institutionalized and strongly linked to capital markets.

India's environmental journey is different because it must manage development, population scale, energy demand and climate vulnerability at the same time. India has committed to net-zero emissions by 2070 and is targeting 500 GW of non-fossil fuel power capacity by 2030. Its renewable energy expansion, green hydrogen mission, electric mobility push, energy-efficiency schemes and sovereign green bonds show serious momentum. India's challenge is not lack of ambition; it is the scale and complexity of execution.

European nations generally have lower development pressure and stronger institutional capacity, while India must decarbonize without slowing economic growth. This makes India's ESG journey more difficult but also more significant. If India succeeds, it will demonstrate that sustainability can be achieved not only by wealthy economies but also by fast-growing developing nations.

### 3. Social Dimension: Inclusion as India's ESG Strength

The social component of ESG is where India's approach becomes especially relevant. India's sustainability story cannot be separated from employment, rural development, financial inclusion, gender participation, health, education, skill development and community impact. ESG in India must serve not only shareholders and regulators but also workers, suppliers, small businesses and communities.

European nations have advanced labour protections, workplace safety standards, diversity policies and human rights due diligence systems. Their ESG frameworks place significant emphasis on value chain responsibility, fair working conditions and stakeholder engagement. However, the European social agenda often operates in already-developed welfare systems, whereas India's social ESG agenda is directly connected with national development and inclusive growth.

India has an opportunity to make ESG more human-centered. While Europe leads in formal standards, India can lead in demonstrating how ESG improves lives at scale. The real test for India will be whether companies move beyond disclosure and create measurable outcomes in employment quality, safety, diversity, local sourcing, supplier empowerment and community resilience.

#### 4. Governance Dimension: From Boardroom Compliance to Strategic Accountability

Governance is the backbone of ESG. European companies are increasingly expected to integrate sustainability into board oversight, risk management, remuneration structures, financial reporting and investor communication. ESG is not treated as a side department; it is linked to enterprise risk and corporate strategy. This level of integration makes European governance expectations more demanding.

India has made strong progress in corporate governance through SEBI regulations, independent director requirements, audit committees, related-party transaction scrutiny and sustainability reporting. Yet many Indian companies still treat ESG as a reporting exercise rather than a strategy and performance discipline. The next stage must be deeper board ownership, stronger internal controls, data assurance and ESG-linked decision-making.

The governance gap is not only regulatory; it is cultural. In Europe, ESG is becoming embedded into corporate accountability. In India, ESG is gaining momentum but must become more integrated into leadership behaviour, capital allocation and operational performance. The companies that achieve this shift will be better prepared for global investors, export markets and supply chain expectations.

#### 5. Comparison Table: India and European Nations

| Area                | India                                                                                | European Nations                                                          |
|---------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Regulatory maturity | Developing rapidly through BRSR, BRSR Core and sectoral sustainability policies.     | Highly mature with CSRD, ESRS, EU Taxonomy and due diligence frameworks.  |
| Reporting style     | Principles-based, practical and phased.                                              | Detailed, mandatory, standardized and assurance-driven.                   |
| Climate ambition    | Net zero by 2070; strong renewable energy expansion and non-fossil capacity targets. | Climate neutrality ambitions with stronger near-term regulatory controls. |

| Area               | India                                                                         | European Nations                                                                    |
|--------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Value chain focus  | Emerging and gradually expanding.                                             | More advanced, especially through supply chain and due diligence obligations.       |
| Social focus       | Strong link to inclusion, employment, communities and development priorities. | Strong labour, human rights and welfare standards supported by mature institutions. |
| Business challenge | Data quality, assurance readiness, supplier capacity and cost of transition.  | Complexity, compliance burden and regulatory fatigue.                               |
| Strategic strength | Scale, affordability, innovation and inclusive growth potential.              | Transparency, comparability, investor confidence and regulatory discipline.         |

#### 6. Business Impact: What This Means for Indian Companies

For Indian companies, ESG is becoming a passport to global competitiveness. Companies exporting to Europe or supplying European customers will face increasing pressure to provide emissions data, human rights information, supplier traceability and credible sustainability performance. Even if Indian regulation remains more flexible than European regulation, the market will push Indian companies toward European-level expectations.

This creates both risk and opportunity. The risk is that companies with weak ESG systems may lose access to premium markets, green finance and international partnerships. The opportunity is that companies that invest early in ESG data, renewable energy, ethical supply chains and transparent governance can become preferred suppliers and trusted investment destinations.

The smart approach for Indian companies is not to maintain separate systems for India and Europe. They should build one integrated ESG management system that satisfies domestic BRSR expectations while also preparing for CSRD-style value chain scrutiny. This means stronger data architecture, internal controls, carbon accounting, supplier engagement and board-level monitoring.



## 7. Key Gaps in India's ESG Environment

India's ESG environment is moving in the right direction, but several gaps remain. First, ESG data quality is uneven across sectors. Many companies still depend on manual collection, inconsistent definitions and limited assurance. Second, Scope 3 emissions and supplier-level information are still at an early stage. Third, small and medium enterprises often lack the resources to meet rising ESG expectations. Fourth, sustainability is sometimes managed as compliance rather than transformation.

A central challenge for India is that ESG implementation operates under conditions far more demanding than those faced by many European nations. India's population pressure creates a "population bomb" effect, where the scale of consumption, employment, urbanization, waste generation and service delivery makes sustainability execution extremely complex. This is compounded by regulatory red tape, overlapping approvals and procedural delays that can slow green projects and discourage timely compliance. The challenge of funds is equally serious, as many Indian businesses—especially micro, small and medium enterprises—lack affordable capital to invest in clean technology, ESG data systems, energy efficiency, worker welfare and supply chain monitoring. Lower literacy levels and limited ESG awareness in parts of the workforce and supplier base further weaken implementation capacity. In addition, India's infrastructure gap, when compared with many European nations, affects renewable integration, waste management, public transport, water systems, digital reporting and compliance monitoring. These realities make ESG in India not merely a reporting challenge, but a large-scale developmental challenge that requires funding support, simpler regulation, capacity building and stronger infrastructure.

Europe also faces challenges. Its ESG system has been criticized for complexity, high compliance costs and reporting burden. Recent simplification efforts show that even advanced regulatory systems must remain practical. This is an important lesson for India: ESG rules must be ambitious enough to build trust, but simple enough to encourage adoption.

## 8. Strategic Recommendations for India

- **Build stronger ESG data systems:** Companies should move from manual reporting to digital, auditable and decision-ready ESG data platforms.
- **Strengthen assurance readiness:** Indian businesses should prepare for greater third-party verification of sustainability information.

- **Develop supplier ESG capability:** Large companies must help smaller suppliers improve emissions tracking, labour practices and governance systems.
- **Link ESG with strategy:** ESG should be connected to capital allocation, product design, risk management and leadership performance.
- **Balance global standards with Indian realities:** India should align with global frameworks while preserving flexibility for development priorities.
- **Promote green finance:** Banks, investors and regulators should support credible transition plans, renewable energy projects and climate-resilient infrastructure.

## Conclusion

The ESG comparison between India and European nations shows two powerful but different sustainability journeys. Europe represents regulatory maturity, disclosure discipline and investor-grade transparency. India represents scale, growth, inclusion and practical transformation. Europe is ahead in formal ESG architecture, but India has the opportunity to create a sustainability model that is agile, inclusive and globally relevant.

The future will not be won by the strictest framework alone. It will be won by the most effective framework: one that produces real emissions reduction, responsible supply chains, ethical governance, social progress and investor confidence. For India, the final lesson is clear: compliance and monitoring are far more difficult and challenging than in many European nations because of India's scale, diversity of industries, large informal economy, fragmented supply chains, uneven data systems and varying institutional capacity across regions. Therefore, India cannot succeed through complexity alone. It requires simplicity in governance, clarity in compliance expectations and strong, capable regulatory bodies that can guide, monitor and enforce implementation with consistency. By learning from Europe while designing for Indian realities, India can move from ESG compliance to ESG leadership.

In short, India's ESG success depends on a smart and agile model: simple rules, strong institutions, practical monitoring, credible data and firm accountability. Europe shows the value of regulatory discipline, but India needs a governance framework that is easier to understand, easier to implement and strong enough to deliver real results. Simplicity should not mean weakness; it should mean focused regulation, faster adoption and stronger execution. That is the pathway for sustainable ESG implementation in India. **SSB**

# SUSTAINABLE FINANCE IN A VUCA WORLD: KEY FOCUS AREAS FOR COST ACCOUNTANTS

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## Abstract

Every generation learns from the disasters and disruptions it inherits. Yet, the VUCA world today is increasingly confronting the environmental and social consequences of yesterday's pursuit of infrastructure, growth and economic prosperity. The development paradigm can no longer be limited to *how much we build*, but must also consider *what value we create, preserve and sustain*. Sustainable finance is emerging as a critical bridge between financial decision-making and long-term environmental and social value creation. In this changing landscape, Cost Accountants have an opportunity to move beyond traditional cost measurement and become strategic contributors to sustainable growth. This article explores the evolving role of Cost Accountants across three dimensions—**Scope, Opportunity and Potential**: measuring sustainability impacts and associated costs; identifying efficiencies, sustainable practices and emerging green revenue streams; and contributing to strategic planning, capital allocation, ethical reporting and finance advisory. In a world marked by volatility, uncertainty, complexity and ambiguity, the profession has both the capability and responsibility to help businesses build resilience while contributing to a sustainable nation and a better future.

## Why Sustainable Finance Matters Today

The business environment today is increasingly characterized by **Volatility, Uncertainty, Complexity, and Ambiguity (VUCA)**. Geopolitical conflicts, climate-related disasters, supply chain disruptions, technological transformation, changing regulations, and shifting investor expectations are reshaping the way businesses operate and create value.

In such an environment, sustainability is no longer an environmental concern confined to policy discussions. It has become a strategic business imperative influencing investment decisions, capital allocation, risk management, and corporate performance. The financial sector is at the center of this transformation through the rise of sustainable finance—an approach that integrates environmental, social, and governance (ESG) considerations into financial decision-making.

For Cost Accountants, this transition presents both a challenge and an opportunity. Traditionally associated with cost control, budgeting, and performance measurement, the profession is now uniquely positioned to help organizations navigate sustainability risks while unlocking new avenues for value creation.

## Understanding Sustainable Finance through the VUCA Lens:

The relevance of sustainable finance becomes clearer when viewed through the lens of VUCA.

### V – Volatility

The global economy has witnessed significant volatility arising from energy price fluctuations, commodity shortages, inflationary pressures, and geopolitical tensions. Recent disruptions in global energy markets have highlighted how excessive

dependence on traditional energy sources can expose economies and businesses to financial risks.

Organizations are increasingly investing in renewable energy, resource efficiency, and sustainable infrastructure not only to reduce emissions but also to build resilience against future volatility.

### U – Uncertainty

Businesses today operate amid evolving ESG regulations, climate commitments, disclosure requirements, and stakeholder expectations. Investors are demanding greater transparency regarding environmental and social impacts, while regulators are introducing new sustainability reporting frameworks.

In this environment, long-term planning requires organizations to assess not only financial risks but also climate-related and sustainability-related risks.

### C – Complexity

Sustainability challenges rarely exist in isolation. A single investment decision may involve environmental impact, regulatory compliance, community expectations, financing considerations, and technological feasibility.

Managing such interconnected issues requires a multidisciplinary approach where financial analysis must be integrated with environmental and social considerations.

### A – Ambiguity

Despite rapid progress, sustainability continues to face challenges such as inconsistent ESG metrics, evolving reporting standards, greenwashing concerns, and difficulties in measuring impact.

Organizations increasingly need reliable frameworks and professionals capable of converting sustainability ambitions into measurable and credible outcomes.

This is precisely where Cost Accountants can make a meaningful contribution.

## Scope for Cost Accountants: Measuring What Matters

In a VUCA world, sustainability can no longer remain an abstract environmental concept. Investors, regulators, lenders, and consumers increasingly expect organizations to demonstrate measurable environmental and social performance. This is where Cost Accountants can play a pivotal role. Their expertise in measurement, analysis, and reporting enables businesses to translate sustainability objectives into quantifiable financial outcomes.

### Sustainability Cost Analysis

Many organizations underestimate the true cost of unsustainable practices. Excessive energy consumption, water losses, inefficient logistics, and resource wastage often remain hidden within operating costs.

Cost Accountants can identify these inefficiencies and quantify their financial impact, enabling management to make informed decisions regarding sustainability initiatives.

### Carbon Cost Measurement

With the emergence of carbon markets, emission regulations, and sustainability-linked financing, Carbon emissions are increasingly becoming an economic variable. International carbon markets, sustainability-linked financing mechanisms, and emerging climate regulations are gradually assigning a financial value to carbon.

Cost Accountants can support organizations in measuring carbon footprints, evaluating emission-reduction initiatives, and assessing the long-term financial implications of carbon-related risks.

### Life Cycle Costing

Traditional investment decisions often focus on initial acquisition costs. Sustainable decision-making requires consideration of costs throughout the entire life cycle of a product, project, or asset.

Mastering Life Cycle Costing enables organizations to evaluate maintenance costs, operating expenses, disposal costs, and environmental impacts before committing capital.

### Resource Efficiency Analysis

Improving resource productivity is one of the most effective ways to achieve both economic and environmental objectives.

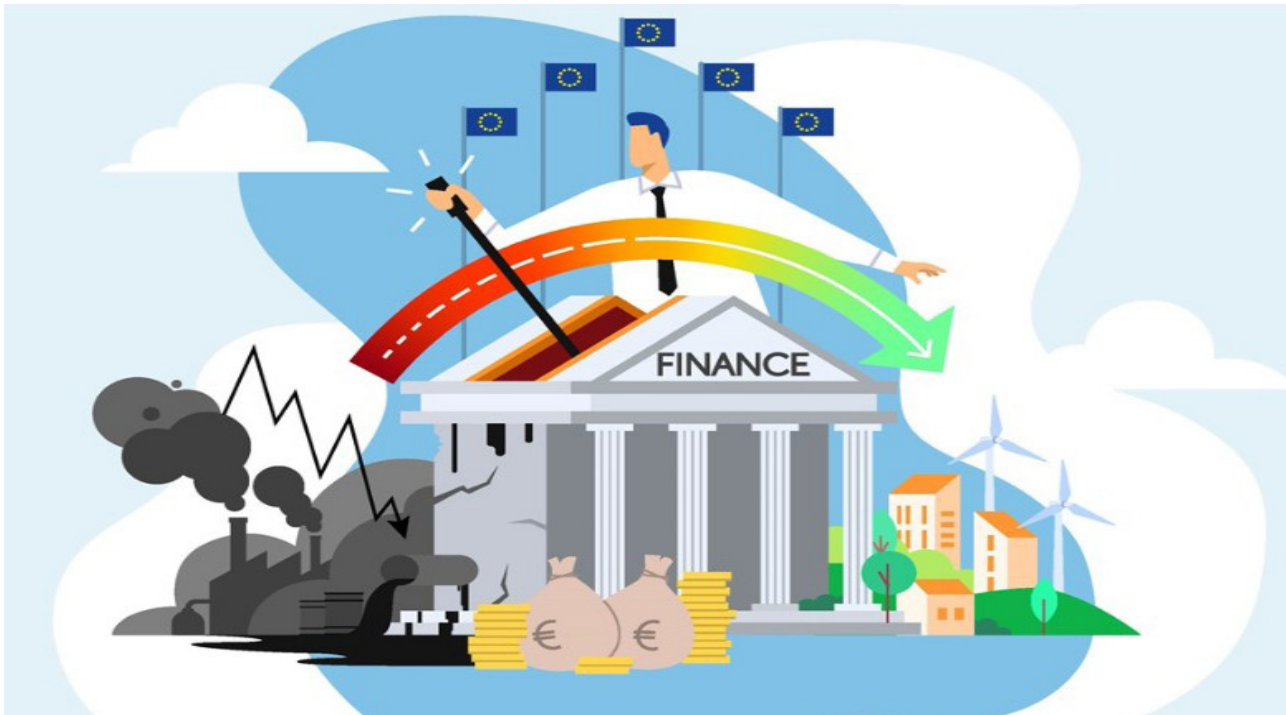
By analyzing resource consumption patterns, Cost Accountants can identify opportunities for reducing energy use, water consumption, raw material losses, and operational inefficiencies.

### Waste Cost Identification

Waste is often viewed purely as an environmental issue. In reality, it represents resources that have been purchased but failed to create value.

Cost Accountants can help organizations quantify waste-related losses and support initiatives based on reuse, recycling, and circular economy principles.





Source: Conceptualised & designed by the author using AI tools

## ESG Performance Measurement

The increasing importance of ESG reporting requires robust systems for collecting and validating sustainability data from transaction level.

Cost Accountants can contribute by developing key performance indicators, strengthening internal controls, and ensuring the reliability of sustainability disclosures.

## Climate Risk Impact Assessment

Recent Climate-related events such as twin earth quakes in Venezuela, Europe's heat wave, floods, droughts, and supply chain disruptions have emerged to be new financial risks for businesses.

Cost Accountants can support management in evaluating the potential financial implications of these risks and integrating them into strategic planning.

The profession's greatest strength lies in its ability to convert sustainability ambitions into measurable metrics, enabling informed decisions that balance profitability with long-term value creation.

## Opportunity: Sustainable Value

The sustainability transition presents one of the most significant opportunities for the Cost Accounting profession in recent decades.

Historically, Cost Accountants focused on controlling expenditure and improving operational efficiency.

## Creating

Today, organizations increasingly require professionals who can help create long-term value while balancing financial, environmental, and social objectives.

## Converting Sustainability into Cost Advantage

Many sustainability initiatives are initially perceived as additional expenditure. However, practical experience demonstrates that sustainability and profitability often move together.

Energy-efficient technologies, water conservation measures, waste reduction programs, and sustainable procurement practices frequently generate measurable financial savings. Organizations that successfully integrate sustainability into operations often benefit from lower operating costs, improved productivity, and reduced business risks.

Cost Accountants can play a crucial role in quantifying these benefits and demonstrating the business case for sustainability investments.

## Supporting Green Investment Decisions

India's transition towards renewable energy, electric mobility, green buildings, water infrastructure, and climate-resilient projects is creating unprecedented investment opportunities. Evaluating such investments requires rigorous financial analysis, life-cycle costing, risk assessment, and performance

measurement—all core competencies of the Cost Accounting profession.

As governments and businesses increasingly allocate capital towards sustainable projects, Cost Accountants can support informed decision-making by balancing financial returns with long-term sustainability objectives.

### Emerging Green Revenue Streams

The sustainability economy is generating entirely new business models and revenue opportunities.

Carbon markets, renewable energy certificates, sustainability-linked financing instruments, green bonds, circular economy initiatives, and sustainable products are creating new avenues for value creation.

Professionals who understand both finance and sustainability will be better positioned to guide organizations in capturing these opportunities.

### Potential: Shaping the Future of the Profession

The future of Cost Accounting lies not merely in measuring costs but in influencing strategic decisions that create sustainable value.

### Strategic Planning and Capital Allocation

Organizations pursuing Net Zero commitments require long-term roadmaps supported by disciplined financial planning. Cost Accountants can contribute by evaluating investment priorities, assessing transition risks, conducting scenario analysis, and supporting capital allocation decisions aligned with sustainability goals.

### Ethical Reporting and and ESG Assurance

In an increasingly transparent business environment, investors and stakeholders demand reliable sustainability information. Cost Accountants possess strong capabilities in governance, controls, verification, and reporting, making them valuable contributors to ESG reporting and assurance frameworks.

Their involvement can enhance the credibility, consistency, and reliability of sustainability disclosures, helping organizations build investor confidence and stakeholder trust.

### Sustainability and Finance Advisory

The convergence of finance and sustainability is creating demand for advisory services related to:

- ESG integration
- Green finance strategies
- Climate-risk assessment
- Sustainable investment appraisal
- Resource optimization
- Sustainability reporting
- Cost Accountants can leverage their analytical expertise to support organizations in navigating sustainability challenges while creating measurable business value.

### Boardroom Participation

Supporting management in balancing profitability with long-term environmental and social objectives.

This represents a natural extension of the profession's analytical and advisory capabilities.

### A Practical Illustration

The strong market response to the ₹10,000 crore Green Infrastructure Bond issued by Bank of Baroda demonstrated the growing investor appetite for sustainable investments in India. Beyond fund mobilisation, such initiatives require robust project evaluation, fund utilisation monitoring, impact measurement, and transparent reporting.

These are precisely the areas where Cost Accountants can contribute meaningfully by combining financial discipline with sustainability accountability.

### Conclusion

The emergence of sustainable finance reflects a fundamental shift in the way businesses create and measure value. In a VUCA world marked by volatility, uncertainty, complexity, and ambiguity, organizations require professionals who can move beyond traditional financial analysis and evaluate long-term sustainability impacts.

For Cost Accountants, this transformation represents a significant opportunity to expand their role from cost controllers to strategic partners in value creation. By measuring sustainability performance, supporting green investments, strengthening ESG reporting, and advising on sustainable business decisions, the profession can play a critical role in building resilient organizations and sustainable economies.

The future of the profession will belong to those who can successfully integrate financial discipline with environmental responsibility, helping businesses achieve growth that is not only profitable but also sustainable. **SB**



VK Webinar Series of the Sustainability Standards Board

64<sup>th</sup> Webinar

August 28, 2026 | 4 to 5-15 p.m.

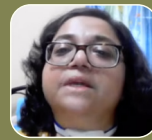
## AI and Sustainability



CMA Dibbendu Roy



Mr. Dattatri HM



CMA (Dr.) Aditi Dasgupta

Sustainability Standards Board (SSB), organised a webinar under its *Vasudhaiva Kutumbakam* Webinar Series on the subject of AI and Sustainability. Mr. Dattatri HM, General Counsel, The Manipal Group was the speaker. CMA (Dr.) Aditi Dasgupta, Joint Director, SSB, ICAI introduced the topic and the guest and welcomed him for the session.

The speaker commenced the presentation by outlining the key agendas relating to a Sustainable AI Ecosystem, Sustainability of AI Technology, and Sustainable Use of AI. He elaborately discussed these dimensions with particular emphasis on emerging global frameworks, ranging from soft guidance and voluntary principles to legally binding regulatory frameworks. He explained the four key pillars of a Sustainable AI Ecosystem, namely Governance and Ethics, Environmental Stewardship, Human-Centric Capability, and Economic Value & Assurance. In this context, he presented a comparative analysis of the global best practices adopted by two leading technology giants, Google and Microsoft, highlighting their respective approaches towards responsible and sustainable AI. He also discussed various multilateral and industry-led initiatives and provided an overview of India's AI and Sustainability Policy Architecture, including the key developments in India's AI and sustainability journey and timeline. The speaker further highlighted the initiatives undertaken by ICAI in the sustainability domain, particularly the ICAI Sustainability Standards ISS1 and ISS2. He explained their relevance and highlighted the various opportunities available for Cost and Management Accountants (CMAs) to contribute to the emerging sustainability and AI ecosystem through assurance, governance, reporting, risk management and strategic decision-making. In the second part of the presentation, the speaker focused on the sustainability of AI technology itself, particularly its significant consumption of electricity and other natural resources. He elaborated on the environmental implications associated with AI prompts, data centres, electricity consumption and water usage. He also discussed the dependence of the AI ecosystem on critical minerals and highlighted China's significant position in the global supply chain of such minerals. Other environmental concerns, including electronic waste (e-waste), emissions arising from AI model training, and the resource intensity of AI infrastructure, were also discussed. The speaker subsequently examined various sustainable alternatives and mitigation measures that could help organisations address the environmental footprint of AI. He highlighted the emerging litigation and regulatory disputes surrounding AI and observed that the increasing cost of AI adoption could constitute a significant barrier for organisations. He emphasised the need for organisations to exercise prudence in AI-related expenditure and suggested that effective governance and rationalisation of AI spending would be essential for sustainable adoption. The presentation also covered data security, privacy concerns and AI-enabled frauds, highlighting the increasing risks associated with the misuse of AI technologies. The speaker emphasised the importance of appropriate safeguards, controls and governance mechanisms to address these emerging risks. In the concluding part, the speaker addressed the concept of Sustainable Use of AI, explaining the various failure modes and risks associated with AI adoption. He presented relevant case studies concerning the legal and regulatory dimensions of AI, including developments and judicial perspectives emerging from Indian courts. He also discussed different AI models and approaches that may facilitate more sustainable and responsible use of the technology. The speaker further highlighted the importance of developing appropriate AI manuals, policies and operating guidelines at organisational, professional and individual levels. He concluded the session by presenting a practical checklist and set of principles for financial professionals, particularly in the context of the responsible adoption and application of agentic AI. The webinar culminated with a set of recommendations and suggestions aimed at promoting responsible, secure, economically viable and environmentally sustainable adoption of AI.

There were thought-provoking Question and Answer Session, and the faculty answered the queries raised by the participants. CMA Dibbendu Roy, Additional Director and Secretary, SSB, ICAI concluded the webinar and offered the vote of thanks.



65<sup>th</sup> Webinar

September 11, 2026 | 4 to 5-15 p.m.

## ESG in India: From Buzzword to Boardroom Discipline



CMA Dibbendu Roy



CMA Sanjoy Ghosh



CMA (Dr.) Aditi Dasgupta

Sustainability Standards Board (SSB), organised a webinar under its *Vasudhaiva Kutumbakam* Webinar Series on the subject of ESG in India: From Buzzword to Boardroom Discipline. CMA Sanjoy Ghosh, Senior Finance Executive was the speaker. CMA (Dr.) Aditi Dasgupta, Joint Director, SSB, ICMAI introduced the topic and the guest and welcomed him for the session.

The resource persons started his presentation with the premise that Environmental, Social and Governance (ESG) in India has evolved from a largely voluntary and narrative-driven concept into a structured, quantified and increasingly assured component of corporate governance and financial decision-making. He deep dived the traces of this transformation while highlighting India's long-standing traditions of environmental stewardship, social responsibility and accountable governance. He highlighted that from the water-management systems of the Indus Valley civilisation and the governance principles of the *Arthashastra* to Ashoka's welfare-oriented edicts, the presentation establishes that sustainability is not an imported concept but has deep historical roots in Indian governance. He stated that the contemporary ESG landscape, however, is defined by regulation, disclosure, assurance and financial consequences. The introduction of SEBI's Business Responsibility and Sustainability Reporting (BRSR), followed by the BRSR Core framework, has shifted the emphasis from broad sustainability narratives to measurable and comparable information. The assurance glide path is expanding from the top 500 listed entities in FY2025-26 to the top 1,000 in FY2026-27. Consequently, as he inferred that the ESG data is increasingly required to demonstrate clear ownership, consistency, source-to-report lineage and auditability. He highlighted in his presentation the three major forces shaping corporate ESG: regulation, trade and capital. The SEBI's reporting requirements, RBI's climate-related directions, IRDAI's ESG framework and India's Carbon Credit Trading Scheme are strengthening the regulatory dimension. Internationally, the EU's Carbon Border Adjustment Mechanism (CBAM) has transformed carbon intensity into a direct commercial consideration for exporters. At the same time, lenders, investors and ESG rating providers are increasingly demanding credible and consistent sustainability data. The central theme is the migration of ESG responsibility towards the finance function and the CFO. The ESG data must increasingly operate with the discipline of financial information, supported by defined data dictionaries, named owners, periodic capture, source systems, restatement policies and internal audit controls. He further demonstrated how ESG can be integrated into business strategy through the Business Model Canvas, connecting sustainability risks and opportunities with partners, activities, resources, costs, customers and revenue streams. It also presents corporate cases illustrating assurance, decarbonisation, governance, capital allocation and sector-specific materiality. Finally, the presentation highlighted the emerging role of Cost and Management Accountants (CMAs) for their expertise in cost records, energy, material and process data, carbon accounting and audit trails provided a natural foundation for BRSR Core assurance, carbon costing, CBAM compliance and ESG management reporting. He stressed that ESG is no longer about making sustainability claims; it is about producing evidence that can withstand scrutiny. The transition from buzzword to boardroom discipline therefore represents a fundamental change in ownership, controls, accountability and decision-making. Organizations that build robust ESG data systems today will be better positioned for regulatory compliance, market access, capital efficiency and long-term resilience.

There were thought-provoking Question and Answer Session, and the faculty answered the queries raised by the participants. CMA Dibbendu Roy, Additional Director and Secretary, SSB, ICMAI concluded the webinar and offered the vote of thanks.

## Parinayati Webinar series

11<sup>th</sup> Webinar

September 18, 2026 | 4 to 5-30 p.m.

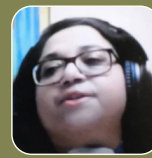
# ESG and Sustainability Reporting in Nepal



CMA Arunabha Saha



Dr. Ranjith Krishnan



CMA (Dr.) Aditi Dasgupta

The Sustainability Standards Board (SSB) of the Institute of Cost Accountants of India (ICMAI), in association with the International Affairs Committee, successfully organized the 11<sup>th</sup> edition of the *Parinayati* Webinar Series on September 18, 2026, from 4 p.m. to 5:30 p.m. The webinar was centred around the theme “ESG and Sustainability Reporting in Nepal”.

The session commenced with an introductory deliberation by CMA Arunabha Saha, Practising Cost Accountant and Coordinator of the webinar series. The presentation provides a visual account of the flood that engulfed Nepal’s Trishuli River corridor on 26 August 2026. It captured the magnitude and severity of the flooding highlighting the affected river corridor and the devastating situation that unfolded. The presentation highlighted the vulnerability of river corridors to extreme flooding and the significant consequences such events can have on communities and infrastructure. He stated that the scale of the disaster was massive and created the thought process of the awareness of the need for disaster preparedness, climate resilience, sustainable infrastructure and effective emergency response mechanisms in vulnerable regions.

CMA (Dr.) Aditi Dasgupta, Joint Director, delivered a comprehensive presentation on the theme of ESG and Sustainability Reporting in Nepal. She highlighted the catastrophic and human dimensions of the recent developments, emphasising the profound impact of environmental and climate-related events on communities, livelihoods, infrastructure and the broader socio-economic fabric. The technical deliberations underscored the interconnected nature of the Sustainable Development Goals (SDGs) and the shared responsibility of governments, businesses, financial institutions, investors, consumers and the wider value chain in advancing sustainable development. The presentation further examined Nepal’s emerging ESG ecosystem, encompassing government and environmental regulations, SEBON and the capital markets, financial institutions including Nepal Rastra Bank, corporates and consumers, supported by national climate policies, Nationally Determined Contributions (NDCs) and sustainability disclosures. Sector-specific ESG materiality was also discussed, covering financed climate risk and financial inclusion in the banking sector; biodiversity and community considerations in hydropower; emissions, occupational safety and community health in the cement sector; energy consumption and e-waste management in telecommunications; physical climate risks and resilience in insurance; and water, waste management and local community considerations in tourism. She emphasised that a uniform ESG framework cannot adequately address the diverse risks and priorities of Nepal’s different sectors. Instead, materiality should be determined in accordance with the nature, risks, operational characteristics and business models of individual sectors. The session highlighted that credible and transparent sustainability reporting which can play a significant role in strengthening accountability, resilience, stakeholder confidence and informed decision-making.

Dr. Ranjith Krishnan, Associate Professor, CHRIST University and Member, SSB, ICMAI, responded to various queries raised by the participants during the webinar and provided further insights on the issues which were discussed. He thereafter delivered the closing remarks and proposed the Vote of Thanks, expressing appreciation to the speakers, participants and all those associated with the successful conduct of the programme. The webinar was subsequently concluded.



# Forthcoming Vasudhaiva Kutumbakam Series



VK Webinar Series of the Sustainability Standards Board

FORTHCOMING WEBINARS

**ICMAI** THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

**CPE Credit: 1 Hour** | **4 PM – 5:15 PM** | Friday | September 25, 2026

**66<sup>th</sup>**

**BUSINESS SUSTAINABILITY ASSURANCE THROUGH FRAUD RISK & FORENSIC MANAGEMENT**

Organised by **Sustainability Standards Board**

**RESOURCE PERSON**

**CMA (Dr.) Subhasish Roy Chowdhury**  
Business Consultant / Practitioner & Academics

**CMA Chittaranjan Chattopadhyay** (President, ICMAI)  
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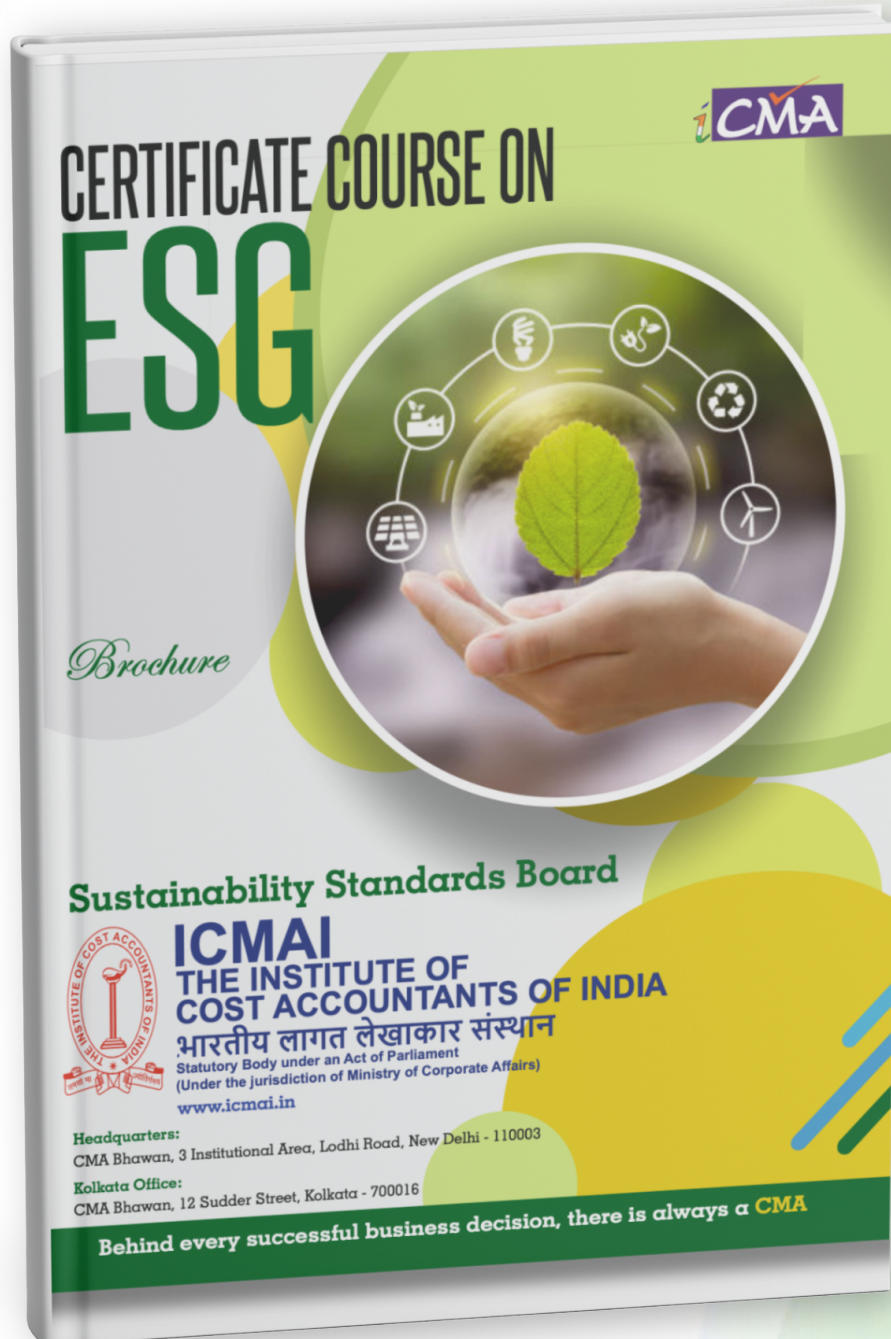
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*Circular Economy 2.0: When Waste Becomes Wealth***AI, BUSINESS TRANSFORMATION AND THE EXPANDING ROLE OF COST AND MANAGEMENT ACCOUNTANTS****CMA (Dr.) Aditi Dasgupta**

Joint Director

The Institute of Cost Accountants of India  
Kolkata

Part: III

**Abstract**

Circular Economy 2.0 represents a fundamental transformation in how businesses create, preserve, and recover value. Powered by artificial intelligence, the Internet of Things, robotics, blockchain, and advanced analytics, it enables organisations to optimise resource utilisation throughout the product lifecycle. From predictive maintenance and intelligent waste sorting to digital product passports and circular supply chains, technology is reshaping the way products are designed, manufactured, used, repaired, and recovered. This transformation also creates new business opportunities through product-as-a-service models, refurbishment, remanufacturing, and reverse logistics. The article highlights the evolving role of Cost and Management Accountants in supporting this transition through Material Flow Cost Accounting, Life Cycle Costing, sustainability reporting, and resource productivity assessment. It emphasises that circularity is not merely an environmental responsibility but a strategic approach to sustainable value creation, operational resilience, and long-term competitiveness.

**Key Point**

Circular Economy 2.0 transforms resource management from a conventional cost function into a strategic driver of sustainable value creation. By combining digital intelligence with innovative business models, organisations can extend product lifecycles, recover valuable materials, reduce waste, and strengthen competitiveness. For Cost and Management Accountants, this reinforces the profession's foundational commitment to optimising resource utilisation—not merely reducing costs, but converting every available resource into greater economic and environmental value.

The discussion so far in previous parts demonstrate that Circular Economy 2.0 is far more than an improved waste management system. It represents a fundamental redesign of the way economies create, preserve, and recover value. However, this transformation would not be possible without another revolution unfolding simultaneously—the rapid advancement of digital technologies. If the first generation of the circular economy was driven by environmental consciousness, the second generation is being propelled by data, intelligence, and connectivity.

Today, artificial intelligence, the Internet of Things (IoT), robotics, blockchain, and advanced analytics are changing not only how businesses manufacture

products but also how they monitor, recover, and regenerate resources. These technologies are enabling organisations to make informed decisions throughout the entire lifecycle of a product, from design and production to consumption, recovery, and reuse. Circularity is no longer dependent solely on human intervention; it is increasingly becoming an intelligent, data-driven system capable of learning, predicting, and continuously improving itself.

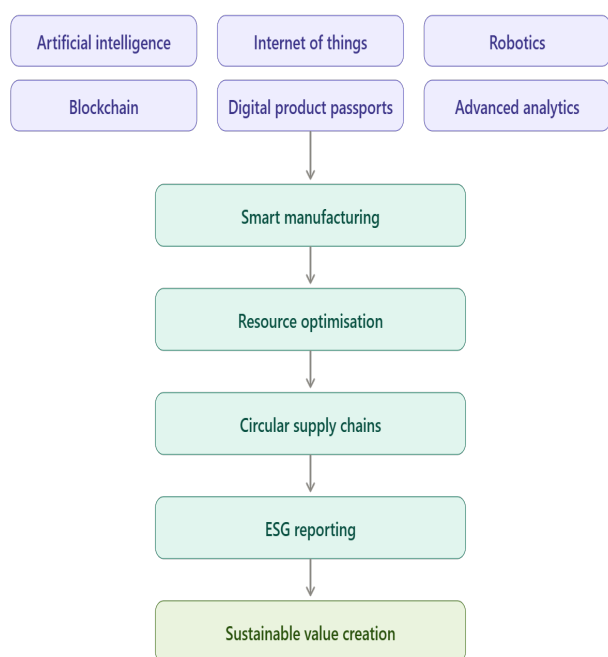
**Artificial Intelligence: The Brain Behind Circular Economy 2.0**

Artificial Intelligence (AI) has become one of the defining technologies of the twenty-first century, and

its influence extends well beyond automation or customer service. Within the circular economy, AI functions as a decision-making engine that helps businesses optimise resource use, minimise waste, and maximise the value embedded in products and materials.

Traditionally, manufacturers relied on historical trends and manual planning to estimate production requirements. This often resulted in overproduction, excess inventories, material wastage, and unnecessary energy consumption. AI-powered predictive analytics now enables businesses to forecast demand with significantly greater accuracy, allowing production to align more closely with actual market needs. Fewer excess products mean fewer resources consumed and less waste generated.

Artificial intelligence is also transforming maintenance practices. Instead of waiting for machinery or products to fail before repairs are undertaken, predictive maintenance systems analyse sensor data to anticipate equipment failures long before they occur. This extends the useful life of industrial assets, reduces downtime, lowers maintenance costs, and delays the need for replacement. In effect, AI contributes to one of the core principles of circularity—keeping products and assets in productive use for as long as possible.



Source: Conceptualised & designed by the author using AI tools

Figure showing the six digital technologies converging into a single downstream flow toward sustainable value creation.

Waste management itself is becoming increasingly intelligent. AI-powered vision systems can recognise different categories of waste within milliseconds, separating plastics, metals, glass, paper, and

electronic components with a level of precision that far exceeds manual sorting. Improved segregation enhances the quality of recycled materials, making them suitable for reuse in high-value manufacturing rather than low-grade applications.

Beyond factories and recycling facilities, AI is supporting cities in becoming more resource-efficient. Smart waste collection systems use real-time data to determine when bins need to be emptied, optimising collection routes, reducing fuel consumption, and improving municipal waste management. Such applications demonstrate that digital intelligence can generate environmental benefits while simultaneously reducing operational costs.



## Building an Intelligent Circular Ecosystem

Artificial intelligence does not operate in isolation. Its true potential emerges when combined with other digital technologies that create a connected ecosystem of information.

The Internet of Things enables physical products to communicate continuously through embedded sensors. These sensors monitor temperature, usage patterns, maintenance requirements, energy consumption, and location, generating valuable information throughout the product's lifecycle. Manufacturers can therefore understand how products are actually used, identify opportunities for design improvements, and recover products more effectively at the end of their service life.

Digital twins take this concept one step further. A digital twin is a virtual representation of a physical product, machine, or manufacturing facility that mirrors its real-world performance in real time. By simulating various operating conditions, organisations can optimise maintenance schedules, improve energy efficiency, minimise material losses, and extend equipment life. Such capabilities support





Source: Conceptualised & designed using AI tools

circularity by reducing unnecessary resource consumption before waste is even created.

Blockchain technology complements these innovations by providing transparency and trust across increasingly complex supply chains. As products move from suppliers to manufacturers, distributors, consumers, repair centres, refurbishers, and recyclers, blockchain creates an immutable record of every transaction and material movement. This traceability enables organisations to verify recycled content, authenticate sustainable sourcing, and demonstrate compliance with regulatory requirements and ESG reporting standards.

Perhaps the most visible symbol of this digital transformation is the Digital Product Passport. More than simply a technical document, it serves as the product's lifelong identity, recording information about materials, repair instructions, environmental performance, recycled content, maintenance history, and recovery options. By making this information readily accessible, Digital Product Passports encourage repair instead of replacement, refurbishment instead of disposal, and recycling instead of landfill.

Together, these technologies are transforming circularity from a reactive waste management strategy into a proactive system of intelligent resource management.

## A New Era of Business Opportunities

The emergence of Circular Economy 2.0 is also redefining how businesses create value. Traditionally, profitability depended on manufacturing and selling increasing quantities of products. The circular

economy challenges this assumption by demonstrating that economic growth can be achieved through extending product life, recovering materials, and providing services rather than simply increasing production volumes.

One of the most significant shifts is the growing popularity of the Product-as-a-Service model. Instead of selling products outright, companies increasingly retain ownership while customers pay for the service the product provides. This approach is already visible in sectors ranging from industrial equipment and office printing to lighting systems and mobility services. Because manufacturers continue to own the products, they have a strong incentive to design them for durability, repairability, and eventual recovery.

The repair economy is experiencing renewed importance as consumers become more conscious of both costs and environmental impacts. Products that can be repaired rather than discarded retain their value for longer periods, reducing resource consumption while generating employment opportunities for skilled technicians and service providers. Similarly, refurbishment and remanufacturing industries are expanding rapidly, particularly in sectors such as electronics, automotive components, heavy machinery, and medical equipment. By restoring used products to near-original performance, these industries reduce production costs while significantly lowering environmental impacts.

Reverse logistics has emerged as another critical component of circular business models. Conventional supply chains move products from manufacturers to consumers. Circular supply chains add a return journey, enabling products, components, and materials to flow back into production systems for



refurbishment, remanufacturing, or recycling. Efficient reverse logistics networks therefore become essential infrastructure for a successful circular economy.

Digital platforms are further accelerating this transformation by supporting sharing economy models that maximise asset utilisation. Rather than owning underutilised products, consumers increasingly access them when needed through digital marketplaces. This approach reduces unnecessary production while creating new revenue streams based on access rather than ownership.

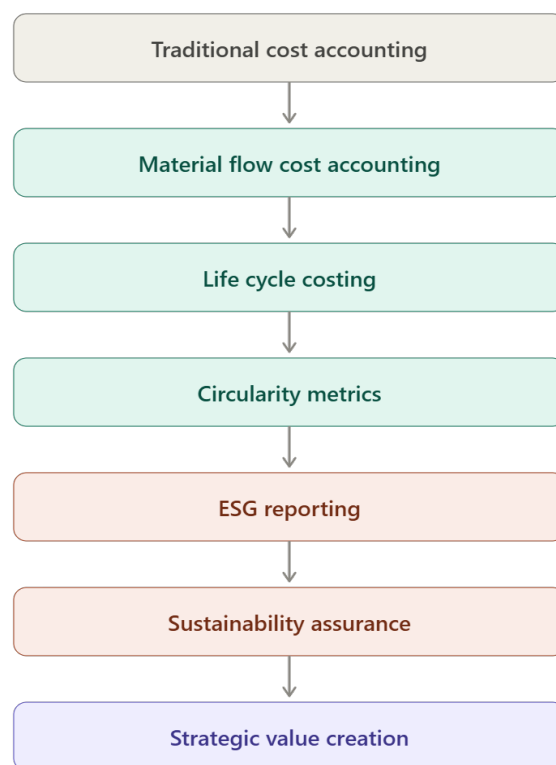
Across industries, businesses are discovering that circularity is not merely about reducing environmental impact. It is opening entirely new markets, creating innovative service models, strengthening customer relationships, and generating competitive advantage in increasingly resource-constrained economies.

## The Strategic Role of Cost and Management Accountants

As organisations embrace Circular Economy 2.0, the role of the Cost and Management Accountant (CMA) is undergoing a significant transformation. Historically, cost accounting focused primarily on measuring production costs, improving operational efficiency, and supporting managerial decision-making. While these responsibilities remain essential, the transition towards sustainable business models requires accounting professionals to broaden their perspective from financial performance alone to comprehensive value creation.

Circular business models require organisations to understand not only how much a product costs to manufacture but also how efficiently resources are used throughout its entire lifecycle. This is where Material Flow Cost Accounting (MFCA) becomes particularly valuable. By tracing the movement of materials through production processes, MFCA identifies hidden costs associated with waste, defects, emissions, and inefficiencies that conventional accounting systems often overlook. What appears as unavoidable waste frequently represents lost economic value that can be recovered through better process design.

Similarly, Life Cycle Costing (LCC) has become increasingly relevant. Traditional costing methods often concentrate on manufacturing expenses while neglecting costs incurred during product use, maintenance, recovery, and disposal. Life Cycle Costing provides a more comprehensive perspective by evaluating costs across the product's entire lifespan. Such analysis supports better design decisions and encourages investments in products that are durable, repairable, and resource-efficient.



Source: Conceptualised & designed by the author using AI tools

The growing emphasis on Environmental, Social, and Governance (ESG) reporting has further expanded the responsibilities of accounting professionals. Organisations are increasingly expected to disclose information relating to resource efficiency, recycled content, waste generation, circularity indicators, and climate-related risks. Cost and Management Accountants possess the analytical expertise required to develop reliable measurement systems, ensure data integrity, and communicate sustainability performance in a manner that is both transparent and decision-useful.

The profession is also assuming an important role in sustainability assurance. As stakeholders demand greater confidence in ESG disclosures, accountants are uniquely positioned to evaluate internal controls, verify non-financial information, and strengthen governance over sustainability reporting systems. Their traditional expertise in assurance and internal control is therefore becoming increasingly valuable in the era of integrated reporting.

Perhaps most significantly, Cost and Management Accountants are helping organisations recognise that waste itself possesses economic value. Materials once written off as production losses can now be measured as recoverable assets capable of generating future revenue. Investment appraisal techniques are likewise evolving to incorporate environmental benefits, resource security, regulatory compliance, and long-term resilience alongside traditional financial returns.



The profession is consequently moving beyond its conventional identity as a custodian of costs. Increasingly, the modern Cost and Management Accountant is becoming a strategic advisor who integrates financial intelligence with sustainability intelligence. In doing so, the profession contributes directly to organisational resilience, responsible resource management, and long-term value creation.

This evolution reflects a broader transformation within the accounting profession itself. The accountant of the future will not simply report how wealth has been created; they will actively help organisations create wealth in ways that preserve natural capital, strengthen stakeholder trust, and support sustainable economic development.

### Case Study

#### Apple's Material Recovery: Designing Electronics for Multiple Lives

The electronics industry illustrates both the challenges and opportunities of Circular Economy 2.0. Every year, millions of smartphones, laptops, and electronic devices reach the end of their useful lives, creating one of the fastest-growing waste streams in the world. Recognising the strategic importance of critical minerals, Apple has invested significantly in material recovery technologies and circular product design.

Its advanced disassembly robots are capable of recovering valuable materials such as aluminium, cobalt, tungsten, rare earth elements, and gold from returned devices with remarkable precision. Increasingly, these recovered materials are incorporated into the production of new devices, reducing reliance on newly mined resources.

Equally important is Apple's emphasis on product design. Components are increasingly engineered to facilitate easier repair, refurbishment, and eventual recycling. Combined with digital tracking of materials throughout the product lifecycle, these initiatives demonstrate how technology can enable a closed-loop production system.

Although Apple operates on a global scale, the broader lesson is universal. The future competitiveness of manufacturing will depend not only on producing high-quality products but also on ensuring that the materials embedded within those products remain valuable long after their first use. **SB**

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# THE NEXT FRONTIER: AI, CLIMATE FINANCE AND REGULATORY CONVERGENCE

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Part: VIII

## Abstract

The final article in the “*From Inner Governance to Institutional Governance: Operationalising ESG – An India–Global Dialogue*” series explores the next phase of ESG, where artificial intelligence, climate finance and regulatory convergence increasingly intersect. It examines India’s emerging carbon-market architecture, green-finance initiatives and evolving BRSR framework alongside global developments in ISSB standards and sustainability-reporting interoperability. The article highlights how AI can transform ESG data from a reporting input into a decision-making resource, while emphasising the importance of data quality, assurance, transparency and human oversight. For CMA professionals, this transition creates an opportunity to connect sustainability metrics with costs, risks, capital allocation and long-term value creation. The article concludes that the future of ESG lies not simply in greater disclosure, but in building credible data, intelligent systems and accountable institutions that embed sustainability into mainstream economic and financial decision-making.

## Introduction: From ESG Reporting to ESG Intelligence

The ESG journey is entering a new phase. What began as a focus on corporate responsibility and disclosure is increasingly becoming a question of data, capital, technology and institutional governance. Artificial intelligence is transforming the way sustainability information is collected and analysed; carbon markets are assigning economic value to emissions; green finance is directing capital towards sustainable activities; and regulators across jurisdictions are working towards greater comparability of sustainability information.

For India, these developments present an opportunity to build an ESG ecosystem that is not merely compliance-oriented but increasingly data-driven, market-linked and decision-focused.

## The New ESG Architecture

The emerging ESG architecture can be understood through three interconnected developments: AI-driven intelligence, climate finance and regulatory convergence.

Traditional ESG reporting has largely followed a cycle of collecting information, preparing disclosures and publishing reports. The next generation will increasingly connect operational data with financial and sustainability information, allowing organisations to identify risks, measure impacts and make faster decisions.

The progression is therefore moving from:

Data → Measurement → Assurance → Intelligence → Decision → Impact

AI can accelerate this process by identifying patterns, anomalies and emerging risks across large datasets. Yet technology does not eliminate the need for governance. The reliability of AI-generated ESG insights will depend on the quality of data, assumptions, controls and human oversight. The future is therefore not simply about artificial intelligence, but accountable intelligence.

## Indian Regulatory and Institutional Context

India is gradually developing the institutional foundations for this transformation. The Carbon



Credit Trading Scheme represents an important step towards creating a domestic carbon market, with compliance and offset mechanisms forming part of the emerging architecture. As carbon becomes an economic variable, the quality of measurement, reporting and verification will become increasingly important.

At the same time, India's green-finance ecosystem is expanding. The RBI's Framework for Acceptance of Green Deposits, along with India's Sovereign Green Bond programme, reflects the growing integration of environmental objectives with financial markets.

BRSR and BRSR Core add another important dimension by strengthening the standardisation and assurance of ESG information.

Together, these developments indicate a broader shift: ESG information is gradually moving from annual disclosure towards institutional decision-making. The next challenge is to connect this information across corporate systems, financial markets and regulatory platforms.

## Global Comparative Perspective: From Multiple Standards to Interoperability

Globally, sustainability reporting has developed through multiple frameworks and regulatory approaches. The emergence of the ISSB Standards, particularly IFRS S1 and IFRS S2, represents an important movement towards a global baseline for sustainability-related financial information.

At the same time, cooperation among the ISSB, GRI and European standard-setting initiatives demonstrates that global convergence does not necessarily mean identical standards. Increasingly, the emphasis is on interoperability—allowing different reporting systems to communicate without forcing organisations to duplicate their entire reporting processes.

This is particularly relevant for Indian companies participating in global supply chains and international capital markets. The future sustainability system may therefore be characterised not by one universal standard, but by common data, comparable metrics and interoperable reporting frameworks.

## AI and the Future of ESG Analytics

AI can transform ESG from a predominantly historical reporting exercise into a more dynamic management tool.

An organisation could, for example, combine energy consumption, production data, climate information

and financial data to identify the operational drivers of emissions. A financial institution could analyse geographical and sectoral exposures to identify potential climate risks within its portfolio. Supply-chain analytics could identify inconsistencies in sustainability claims or emerging risks among suppliers.

But this also creates new governance questions. Who owns the data? How reliable are the underlying sources? What assumptions does the model use? Can its conclusions be explained and independently verified? As ESG decisions become increasingly technology-driven, AI governance will itself become part of ESG governance.

## Implications for CMA Professionals

This transformation creates a significant opportunity for Cost and Management Accountants.

The traditional focus on cost measurement, performance management and decision support is increasingly intersecting with sustainability. Carbon has a cost. Resource inefficiency has a financial consequence. Climate risk can affect investment decisions. Sustainability performance can influence access to finance and market opportunities.

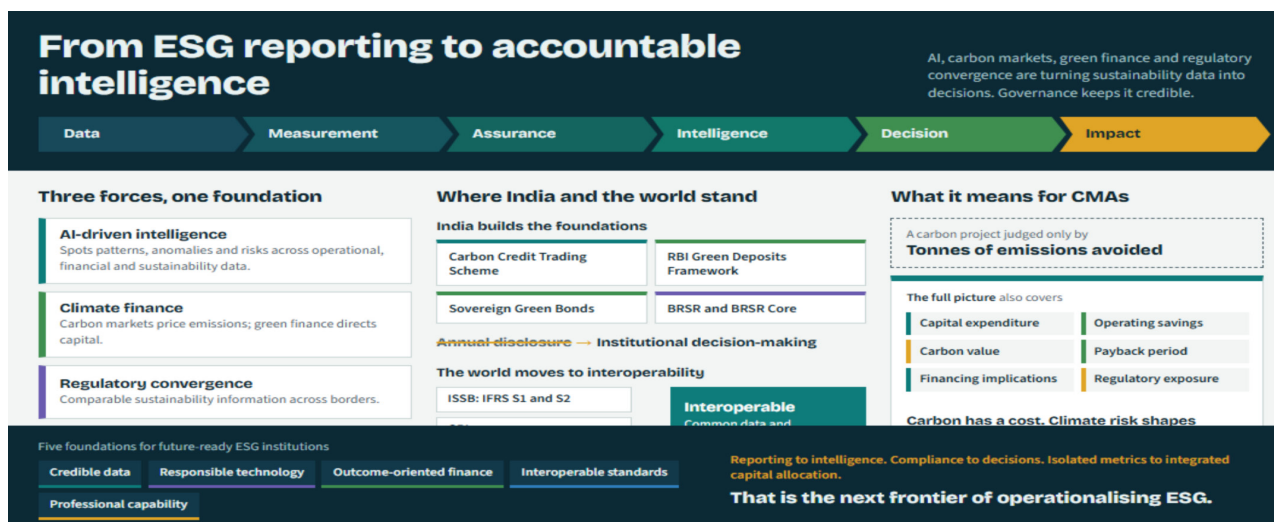
The future CMA will therefore need to connect ESG metrics with financial consequences.

A carbon-reduction project, for instance, should not be evaluated only by tonnes of emissions avoided. Management must also understand capital expenditure, operating savings, carbon value, payback period, financing implications and regulatory exposure. The CMA can consequently play a vital role in converting sustainability information into management intelligence and capital-allocation decisions.

## Way Forward: Building Future-Ready ESG Institutions

The next stage of ESG will require five foundations: credible data, responsible technology, outcome-oriented finance, interoperable standards and professional capability.

India's opportunity lies in bringing these elements together. Its emerging carbon market, green-finance ecosystem, digital capabilities and sustainability-reporting architecture can potentially create an integrated framework in which ESG information supports not only disclosure but also investment, risk management and strategic decision-making. For this to happen, sustainability data must become increasingly reliable, comparable, traceable and assured.



Source: Conceptualised & designed by the author using AI tools

## Conclusion: From Governance to Institutional Intelligence

The journey from inner governance to institutional governance ultimately leads to a new frontier. ESG is moving from reporting to intelligence, from compliance to decision-making, and from isolated metrics to integrated capital allocation.

AI can make sustainability information more intelligent. Carbon markets can give emissions an economic dimension. Green finance can connect sustainability with capital. Regulatory convergence can make information more comparable across borders. But governance remains the foundation that connects all four. For India, the opportunity is not simply to follow global ESG developments but to contribute to a model where sustainability becomes embedded in the functioning of markets and institutions.

For CMA professionals, the opportunity is equally significant: to become the professionals who connect data with decisions, sustainability with economics, and ESG performance with long-term value creation. That is the next frontier of operationalising ESG.

## Closing Note

As we come to the close of this seven-edition journey, From Inner Governance to Institutional Governance: Operationalising ESG — An India–Global Dialogue has sought to explore ESG not merely as a framework of disclosure, but as an evolving system of values, accountability and institutional responsibility. Across the series, we began with the ethical foundations of ESG and its evolution into law, board-level stewardship and governance structures. We then examined the integration of ESG into enterprise risk architecture, followed by the critical dimensions of measurement, materiality and data integrity. The journey continued through disclosure, transparency and capital-market implications, before turning to

assurance frameworks and safeguards against greenwashing. Finally, we looked ahead to the emerging frontier of ESG—artificial intelligence, climate finance and regulatory convergence.

Through these seven editions, our endeavour has been to deepen the dialogue on how values can translate into systems, people into accountability, and governance into institutions—creating a robust foundation for responsible and sustainable business in India and across the global landscape. ESG, ultimately, is not a destination. It is an evolving journey of learning, accountability and institutional transformation. With this, we conclude the present series, with the hope that the conversations initiated here will continue to inform practice, policy and professional thinking.

Thank you for being part of this journey. I look forward to meeting you all again in the next series, as we continue the dialogue and explore the next dimensions of sustainable and responsible business. **SB**

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# GOVERNANCE AND ITS OVERSIGHT ON MANAGEMENT

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Part: VIII

## Abstract

In this article, we discuss the concepts of governance and management and attempt to differentiate between them. The two functions are distinct but have interdependencies. As the governing body is responsible for the oversight and performance of the entity, and because it leans on the management to implement the charted path, it must exercise robust oversight on the management. The presence of non-executive directors, independent directors and a non-executive chairmanship role help in achieving a truly independent and robust oversight on management.

## Introduction

When a sole proprietor runs a small business with a handful of employees, the concepts of governance and management may seem all rolled into one and it may not be necessary to distinguish the two roles. The owner here has the responsibility to manage the entity and there is no separate body of owners to whom the proprietor must account in the corporate governance sense. However, as a business grows, and as the ownership of the entity becomes widespread and publicly held, the role of the governing body becomes crucial. In a corporate set up, owners, that is, the shareholders do not have access to books of account or the right to manage the entity or to take decisions on behalf of the entity merely by virtue of them being owners. The governing body appointed by the shareholders acts as the trusted bridge between the shareholders and the management of the entity. Hence, differentiating the functions of governance and management is of utmost importance if good governance is the aim.

## What is governance and what is management?

The governing body is the eyes, ears and voice of the shareholders, but it does not mean being simply their agent. The board occupies a fiduciary position vis-à-vis the company, while having regard to the interests

of its various stakeholders. The board must ensure that the objects of the company are pursued through a responsible strategy. It also has the responsibility to put in place systems to ensure compliance with applicable laws. Given the fiduciary nature of its role, the board has the duty to exercise due skill, care and diligence in the performance of its functions. The board also must ideally delineate the policies of the entity in various areas and set the expectations of work culture. More importantly, it must provide ethical leadership to the management and the rest of the company.

The management's role is to implement the mandate set by the board and run the affairs of the company on a day-to-day basis. However, management is not simply an agent mechanically executing board instructions. Senior management has substantial delegated authority and makes operational and strategic decisions within the framework approved by the board. They must anticipate and manage operational challenges, report to the governing body regularly and provide inputs for their informed decision-making.

The board relies on the management for effective implementation of the strategy chosen and to generally run the company diligently. The governing body is like the brain of the company, whereas the management is like the musculoskeletal framework



that takes instructions from the brain and reports to it as well. Since these functions are distinct, oversight on management becomes a crucial responsibility of the board.



## Does management overlap with governance?

The management team is generally privy to the operational challenges and ground realities on a real-time basis, while generally updates to the governing body happen on a periodic basis and in exceptional situations. Because management has information and operational knowledge that the board needs, some representation of management on the board can be valuable. Managing director and other executive directors, wherever appointed, are part of the governing body and the management.

However, it is critical to understand that while the same person may be part of the management as well as governance, the functions are still separate. Hence, it is ideal that they themselves recognise the duality of the positions they hold and do justice to both the functions. As a managing director, the person is subject to the overall superintendence of the board. He is responsible to bring the much-needed first-hand information about the entity's functioning to the board. Being a part of the board, he needs to add a layer of thinking above dealing with the entity's problems where he introspects his own actions and evaluates them from a governance perspective.

On the other hand, if the entire board is comprised of the executive members alone, there cannot be an effective oversight on management. Hence, it is important that the board consist of non-executive directors as well. In India, for listed entities, at least half the board is required to be non-executive. Only then can there be a fresh perspective that is not already steeped in the operational challenges and that is not too close to the problem.

Further, in promoter-led entities, members of the promoter family are often inducted as non-executive directors. While promoter representation on the board is understandable, there arises a need to balance the voice of the promoters and the executive with an independent perspective. This is where the role of independent directors becomes vital. Independent directors ideally should bring in an independent and unbiased perspective to the board discussions.

## The leader of the board – the chairperson

The chairperson of the board plays an important role in setting the agenda and with the help of the secretarial function, bringing matters requiring the board's consideration before it. The chairperson also presides over the deliberations of the board and, where the Articles of Association so provide, may exercise a casting vote in the event of an equality of votes.

Since being the chairperson of the board comes with distinct responsibilities and more importantly, discretionary powers, regulatory frameworks for listed entities may provide for separation of the roles of chairpersonship and executive directorship in order to avoid concentration of power and overlapping of competing responsibilities. In India, SEBI had originally mandated separation of the roles of chairperson and MD/CEO for the top 500 listed entities. However, this requirement has subsequently been made voluntary.

Aiming a step further, it is ideal that the chairperson is not related to the promoter group. This would help strengthen independent oversight on management and facilitate appropriately rigorous scrutiny. The current SEBI listing regulations framework also recognises the importance of the relationship between the non-executive chairperson and promoters: where the non-executive chairperson is a promoter or related to a promoter or the management, the independent-director requirement rises to at least half the board.

## Conclusion

Governance, in a way, is stewardship of the company and its stakeholders. The strength of governance lies not in the board doing the work of management, but in its ability to guide, question and oversee management effectively. Effective oversight of management is therefore a *sine qua non* of good governance. **SB**

*Reproduced with suitable modifications from the personal writings and posts of Ms. Usha Ganapathy Subramanian.*

# ESG DASHBOARDS – TURNING DATA INTO DECISIONS

## *Bridging ESG Measurement With Real-World Decision-Making*

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Episode: V

### Abstract

This episode explores how ESG dashboards can transform sustainability data from a reporting requirement into a practical management tool. It examines the role of relevant ESG KPIs, Business Intelligence (BI), and integration with Management Information Systems (MIS) in bringing environmental, social, and governance information together. The discussion emphasizes that effective dashboards should go beyond displaying numbers by connecting performance indicators with targets, trends, financial implications, and management actions. It also considers how timely data can support operational decision-making, identify emerging risks, and connect sustainability performance with cost, productivity, and long-term value creation. Particular attention is given to dashboard design from the perspective of different users, including operations, finance, sustainability teams, and senior management. Ultimately, the episode highlights a simple progression: Data → Insight → Action, demonstrating how well-designed ESG dashboards can make sustainability an integral part of everyday business management.

SUSTAINABILITY IN NUMBERS:  
FROM METRICS TO MANAGEMENT

In the earlier episodes of Sustainability in Numbers, we explored why sustainability begins with measurement. We looked at carbon accounting, examined water, waste, and material efficiency, and then moved towards understanding how social performance can be measured. Each episode has brought us closer to one important question: How can organizations turn sustainability data into better business decisions?

That question becomes particularly relevant when we consider the amount of data organizations generate every day. A manufacturing plant records energy consumption, water use, production output, material losses, and waste. The human resources department tracks employee turnover, training, diversity, and workplace safety. The finance team monitors costs, budgets, and financial performance. Meanwhile, sustainability teams are expected to bring these different pieces together and explain what they mean for the organization.

But having data is not the same as using it effectively. A company may have hundreds of ESG indicators spread across spreadsheets, reports, and different

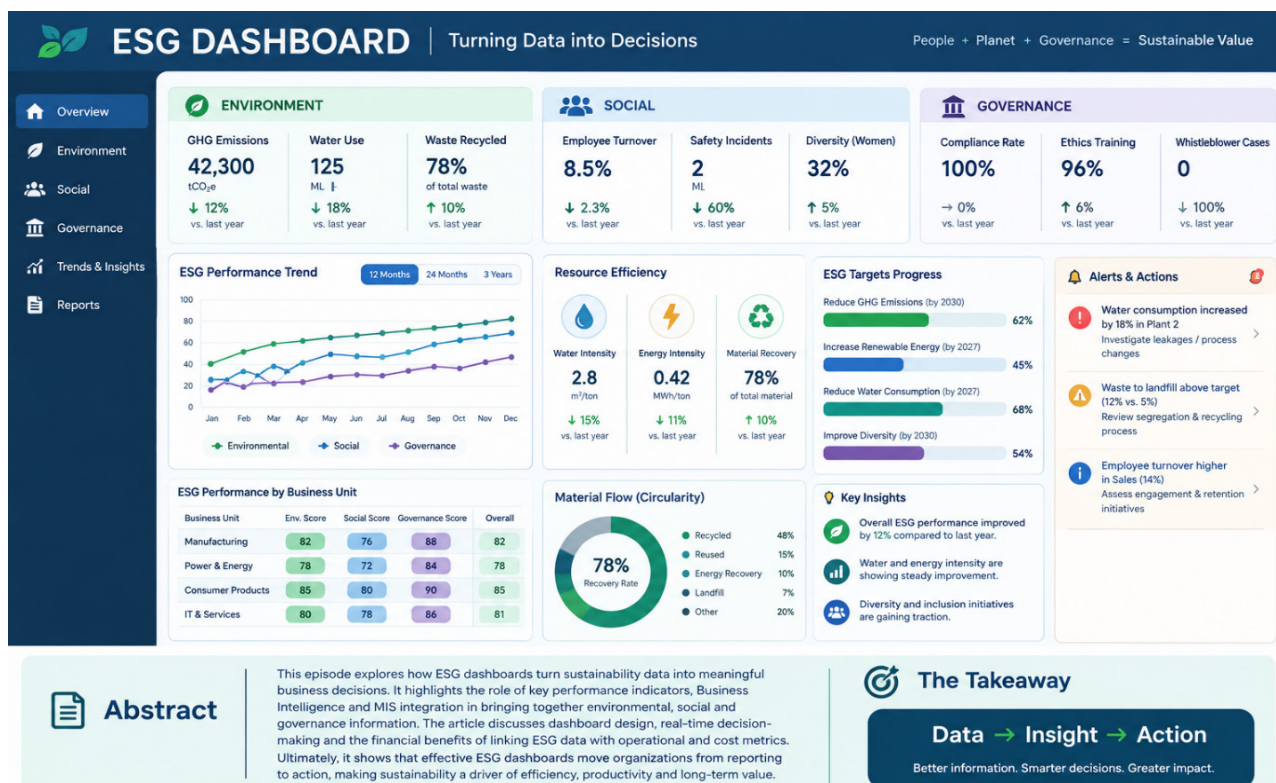
software systems. Yet, when a manager asks, “Why has our resource consumption increased this month?” or “Are our sustainability targets actually being achieved?”, finding the answer may take days.

This is where ESG dashboards enter the picture. A well-designed dashboard does more than display numbers. It brings the right information together, makes important changes visible, and helps management decide what needs attention. The journey from measurement to management therefore takes another step forward: Data → Insight → Action.

## Understanding ESG Dashboards

Think of an ESG dashboard as the management control panel for sustainability performance. Just as a financial dashboard helps management understand revenue, costs, margins, and cash flow, an ESG dashboard provides a clear view of the organization’s environmental, social, and governance performance.

The idea is simple. Instead of searching through lengthy sustainability reports or multiple



Source: Conceptualised & designed by the author using AI tools

## Visual of how an actual management dashboard differs from a conventional ESG report.

spreadsheets, decision-makers should be able to see the indicators that matter, understand how performance is changing, and identify where action may be required.

For example, a manufacturing manager may want to know whether water consumption per unit of production has improved. A finance professional may be interested in the cost of waste generation. The human resources team may be monitoring employee turnover or safety incidents. A board committee may want to understand whether the organization is progressing towards its sustainability commitments. These are different questions, but they all depend on reliable information presented in a meaningful way.

A useful ESG dashboard brings together three things: the indicator being measured, the target against which performance is assessed, and the action that may be required when performance falls short. The dashboard is therefore not merely a reporting screen. It is a way of connecting sustainability performance with managerial responsibility.

## ESG KPIs: Measuring What Really Matters

The quality of an ESG dashboard depends largely on the quality of the indicators behind it. Not every number deserves a place on the management screen.

A Key Performance Indicator, or KPI, should help answer a specific business question. For environmental performance, this might include greenhouse gas emissions, energy intensity, water consumption, waste generation, or the proportion of materials recovered. Social indicators may include employee turnover, training hours, workplace accidents, absenteeism, and diversity. Governance indicators may cover ethics training, compliance issues, whistleblower cases, or the timely resolution of identified concerns.

The important point is that these indicators should not be selected simply because they are easy to collect. They should be relevant to the organization's activities, material sustainability issues, stakeholder expectations, and strategic objectives.

Consider water consumption. Reporting total water use may tell us how much water the organization has withdrawn, but it may not tell us whether operations have become more efficient. Water consumption per unit of production, on the other hand, provides a more useful basis for comparing performance when production volumes change.

The same principle applies to waste. A reduction in total waste may appear positive, but if production has also declined significantly, the improvement may not reflect greater efficiency. Measuring waste per unit of output can provide a more meaningful picture.



This is why ESG dashboards should combine absolute figures with relevant intensity measures, targets, and trends. The objective is not to fill a screen with indicators. It is to identify the numbers that help management understand performance.

## The Role of Business Intelligence in ESG Management

Once the relevant KPIs have been identified, the next challenge is bringing the data together. This is where Business Intelligence, or BI, becomes valuable. Business Intelligence refers to the technologies and analytical processes used to collect, organize, analyze, and present information for decision-making. In the context of ESG, BI can connect data from different parts of the organization and convert it into information that managers can actually use.

Imagine a company where water consumption is recorded by the production department, electricity usage is maintained by the facilities team, waste data is handled by the sustainability department, and cost information sits within the finance system. If these systems operate independently, understanding the relationship between resource consumption and production costs can be difficult.

A BI-enabled ESG dashboard can bring these datasets together. Management may then discover that a particular production line consumes significantly more water than others, or that an increase in material waste is contributing to higher procurement costs. Such insights are more valuable than isolated figures because they explain the relationship between operational activity and business performance.

BI also allows management to move beyond looking at what happened. Historical data can help identify trends, while comparisons across facilities, departments, or production lines can reveal differences in performance. In more advanced systems, alerts and predictive analysis may help identify emerging problems before they become significant.

However, technology alone does not create better decisions. The value of BI depends on the reliability of the underlying data, the quality of the analysis, and the willingness of managers to act on the information.

## Integrating ESG into MIS Systems

For ESG dashboards to become part of everyday management, they need to be connected to the organization's existing Management Information Systems, or MIS. Traditionally, MIS has helped management monitor sales, production, inventory, costs, budgets, and financial performance. Sustainability data has often been maintained

separately, sometimes through spreadsheets or periodic reporting exercises. This separation creates a gap between business performance and sustainability performance.

Integrating ESG into MIS helps close that gap. Consider a production manager reviewing the performance of a manufacturing unit. The existing MIS may show production volumes, machine utilization, material costs, and operating expenses. If water consumption, waste generation, and emissions intensity are also available within the same management reporting framework, the manager can evaluate operational performance more comprehensively.

The discussion changes from "How much did we produce?" to "How efficiently did we produce it?" This integration also makes sustainability more relevant to finance and cost management. A procurement system can capture the cost and quantity of materials purchased. A production system can record material consumption and output. A waste management system can record disposal and recovery. When these systems are connected, management can examine the financial implications of material losses and resource inefficiencies.

The result is not a separate sustainability report prepared after the business activity has taken place. It is a management information system that incorporates sustainability into the business activity itself.



## From Dashboard Design to Management Action

A dashboard may look impressive, but its real test is whether it helps someone make a better decision. This is where dashboard design becomes important. A management dashboard should be clear, focused,



and relevant to the person using it. The information required by a plant manager will differ from that required by the CFO or the board.

A plant manager may need to see daily water consumption, material losses, machine efficiency, and production output. A finance professional may want to understand the cost implications of these indicators. Senior management may prefer a broader view of progress against sustainability targets, operational risks, and financial performance.

A well-designed dashboard should therefore make the most important information immediately visible. It should show whether performance is improving or deteriorating, whether targets are being met, and where management attention is needed.

For instance, if water consumption per unit of output rises sharply on one production line, the dashboard should help the manager identify the issue. Is there a leakage? Has the production process changed? Is equipment maintenance overdue? Has the volume of rejected production increased?

The dashboard does not necessarily answer every question by itself. Its role is to make the right question visible early enough for management to investigate and respond. This is the difference between a dashboard that merely reports performance and one that supports decision-making.

### Real-Time Decision-Making: From Information to Intervention

One of the most useful advantages of digital dashboards is the ability to make information available closer to the time when decisions are taken. In a traditional reporting cycle, sustainability data may be collected at the end of the month, reviewed later, and presented in a quarterly report. By then, an

operational inefficiency may have continued for weeks.

Consider a production facility where water consumption suddenly increases. If the information becomes visible only during the monthly review, the organization may already have incurred additional utility and treatment costs. If the increase is identified through a timely dashboard alert, the maintenance team can investigate the issue much earlier.

The same principle applies to waste, energy, safety, and employee-related indicators. Timely information allows managers to respond before a small problem becomes a larger operational or financial concern.

However, it is important to distinguish between real-time data and real-time decision-making. Not every ESG indicator needs to be updated every minute. Some indicators, such as employee turnover or diversity statistics, may be reviewed monthly or quarterly. The appropriate reporting frequency depends on the nature of the indicator and the decision it supports.

The objective is not to collect data faster simply because technology allows it. The objective is to make information available when it can improve the quality and timing of a decision.

### The Financial Case for ESG Dashboards

The business value of ESG dashboards becomes clearer when sustainability information is connected to financial performance. For management accountants, this connection is particularly important. Sustainability data can help explain why costs are changing, where operational inefficiencies are occurring, and whether improvement initiatives are delivering the expected results.

Suppose a company introduces a water-efficiency initiative. A dashboard can track the change in water consumption, compare it with production output, and connect the improvement with utility costs. Similarly, a waste reduction programme can be evaluated through changes in material losses, disposal expenses, and production yield. This creates a more complete picture of performance.

Instead of reporting that “water consumption decreased,” management can examine whether the reduction resulted in lower operating costs, improved resource intensity, or a change in production volumes. Instead of reporting that “waste recycling increased,” management can consider whether the initiative also reduced disposal costs or improved material recovery.

This is where the role of the CMA becomes particularly relevant. Management accountants can help design KPIs, establish cost relationships, interpret variances, and evaluate the financial implications of sustainability performance.

An ESG dashboard should therefore not be viewed as a sustainability team’s reporting tool alone. It can become a shared management instrument connecting operations, finance, sustainability, and senior leadership.

## The Strategic Perspective

As organizations become more data-driven, sustainability management is also becoming more analytical. The challenge is no longer simply to collect ESG information. It is to understand which information matters, how different indicators relate to one another, and what the organization should do in response.

ESG dashboards provide a practical way to bring sustainability into the rhythm of management. They support performance reviews, target monitoring, risk identification, resource allocation, and accountability.

They also encourage a change in organizational culture. When sustainability indicators are reviewed alongside financial and operational KPIs, responsibility for sustainability is no longer confined to one department. Production managers, finance teams, human resources professionals, procurement officers, and senior leadership all become part of the performance conversation.

But this requires more than installing software. It requires clear ownership of KPIs, reliable data, consistent definitions, appropriate reporting frequencies, and a management culture that values evidence-based decisions. The most effective ESG dashboard is not necessarily the one with the most sophisticated technology. It is the one that helps the right person make the right decision at the right time.

Across this series, we have seen how sustainability measurement can evolve from carbon accounting and resource efficiency into broader management practice. ESG dashboards represent the next step in that journey.

They bring together the numbers that organizations already generate, give those numbers meaning, and help translate them into action. When integrated with Business Intelligence and MIS systems, they can make sustainability performance more visible, more accountable, and more closely connected to everyday business decisions. The real achievement is not the dashboard itself. It is what happens after someone looks at it.

A rising waste indicator should lead to investigation. A declining safety performance should lead to intervention. A favourable sustainability trend should encourage management to understand what worked and whether the improvement can be sustained. That is when data becomes useful. That is when measurement becomes management. **SB**

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## Editorial Note

### The Hidden Bond on Earth

#### *The 10<sup>th</sup> and Concluding Series*

Every series has a beginning, a journey and, eventually, a natural point of closure. “The Hidden Bond That Sustains Life on Earth” marks the 10<sup>th</sup> and concluding series of our journey.

Over the course of these ten series, we have explored different ideas, perspectives and dimensions of life and the world around us. Each topic has tried to make us pause, look beyond the obvious and discover the deeper connections that often remain unnoticed in our everyday lives.

We chose to conclude with “The Hidden Bond That Sustains Life on Earth” deliberately. After exploring many different subjects, it felt appropriate to end by returning to the most fundamental truth: nothing exists entirely on its own. Life is sustained by relationships—between people, nature, communities, institutions and countless living organisms. Understanding these connections also brings us naturally to the idea of sustainability.

At the same time, a series of similar articles cannot continue indefinitely. Even a good idea gradually loses its freshness when stretched for too long. Like a good conversation, a series is most meaningful when it knows when to pause. Ending at the right moment preserves its value, rather than allowing familiarity to replace curiosity.

The conclusion, however, is not an ending of thought. It is an invitation to carry these ideas forward.

We hope these ten series have encouraged readers not merely to read, but to observe, question, connect and think differently.

And perhaps that is the best place to conclude—with a simple thought:

*“Life has always needed life.”*

The series ends here. The conversation does not.

**CMA Arunabha Saha**

Editor, SSB Newsletter (*Sukhinobhavantu*)

25<sup>th</sup> September, 2026

# THE SCIENCE OF INTERDEPENDENCE: HOW LIFE SUSTAINS LIFE AND BUILDS A SUSTAINABLE EARTH

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Thane

Series: X

## Abstract

Life on Earth is built on relationships. Plants, animals, microorganisms, ecosystems and human beings depend on one another in ways that are often invisible. This interdependence is one of the foundations of ecological balance and sustainability. From the oxygen we breathe and the food we eat to the microorganisms within our bodies, life survives because different parts of nature work together. Understanding these connections can help us build a more sustainable relationship with our planet and with one another.

## Introduction: Nothing Alive Stands Alone

Look closely at any living thing and you will find a connection to something else.

A tree cannot grow without sunlight, water, soil and microorganisms. A bee cannot survive without flowers. A flower cannot reproduce efficiently without pollinators. Human beings cannot live without oxygen, food and water.

We often think of ourselves as independent individuals. In the same way, we sometimes imagine nature as a collection of separate species, each fighting for survival. Competition certainly exists in nature, but it is only one part of the story. Alongside competition, there is cooperation, exchange and dependence.

The scientific term for this relationship is interdependence. It means that living organisms depend on one another, directly or indirectly, for survival.

The original article describes life as a “web of borrowed help”, where one living system depends upon another.

This idea is also central to sustainability. A system can remain sustainable only when its different parts continue to function and support one another without exhausting the resources on which future life depends.

As Rachel Carson famously wrote:

**“In nature nothing exists alone.”**

Once we understand this principle, even ordinary things—a breath of air, a meal, a cup of coffee—begin to tell a much bigger story.

## The Air We Breathe: A Partnership Between Plants and Animals

Take a slow breath.

The oxygen entering our lungs did not appear from nowhere. Plants, algae and other photosynthetic organisms play a vital role in producing oxygen. Through photosynthesis, plants use sunlight to convert carbon dioxide and water into food while releasing oxygen.

Humans and animals use that oxygen for respiration and release carbon dioxide. Plants can then use that carbon dioxide again.

It is a continuous exchange.

The original article describes this relationship as a quiet partnership between plants and animals that has operated for an extraordinarily long period of Earth’s history.

We normally do not think about this when we breathe. Yet every breath reminds us that our survival is connected to the wider natural world.



This is a simple example of natural sustainability. Nature does not operate as a one-way system in which something is used and simply disappears. Many natural processes operate through cycles—carbon, water, nutrients and energy moving through different parts of the ecosystem.

When these cycles remain healthy, ecosystems can continue to support life.

When human activities disturb them too severely, the consequences can be felt far beyond the original source of the disturbance.

## The Forest Beneath the Forest

A forest appears to be a collection of trees standing independently. But beneath the surface is another world.

Tree roots can form relationships with thread-like fungi known as mycorrhizae. These fungi associate with plant roots and can help plants obtain nutrients and water from the soil. In return, the fungi receive carbon compounds from the plants.

The original article describes this hidden network as the “wood wide web.”

This relationship reminds us that what we see above the ground is only part of the forest.

There are also bacteria, fungi, insects, worms and countless microorganisms working within the soil. Fallen leaves become nutrients. Dead organisms return material to the soil. Roots interact with microorganisms. Water carries nutrients through the ecosystem.

A forest is therefore not simply “trees.”

It is a living system of relationships.

This has an important lesson for sustainability. If we protect only the visible part of nature while damaging the invisible systems beneath it, we may believe that the ecosystem is healthy when it is actually becoming weaker.

Sustainability requires us to look at the whole system, not merely one component.

## The Bee and the Flower: A Partnership That Feeds the World

Consider a honeybee visiting a flower.

The bee is looking for nectar and pollen to support itself and its colony. The flower, meanwhile, needs pollination to reproduce. When the bee moves from one flower to another, pollen may be transferred.

Both benefit.

The bee receives food. The flower gets an opportunity to reproduce.

The remarkable thing is that neither needs to understand the larger relationship. Each simply follows its natural behaviour.

The original article points out that pollinators such as bees, butterflies and bats support the production of many foods that humans consume.

This connection becomes particularly important when pollinator populations decline.

If bees disappear from an agricultural region, the immediate problem may appear to be a problem for beekeepers. But the effect can move outward—to farmers, crop production, food prices and consumers.

This is how interdependence works.

A small change at one point in the system can create consequences somewhere else.

For sustainability, this means biodiversity is not simply about protecting beautiful or rare species. Different species often perform functions that support agriculture, ecosystems and human life.



## The Wolf that Reshaped a River

Perhaps one of the most fascinating examples of ecological interdependence comes from Yellowstone National Park in the United States.

Wolves were reintroduced to the park in the 1990s after being absent for decades. Their return affected the behaviour and distribution of deer and elk. As grazing pressure changed, vegetation in certain areas recovered.



The return of vegetation contributed to further ecological changes. Beavers benefited from improved vegetation and helped create wetlands through dam building. These wetlands provided habitat for fish, birds and other animals.

The original article uses this example to explain a trophic cascade—a chain of ecological effects that can spread through an ecosystem when the population or behaviour of one species change.

The striking lesson is this:

A predator that hunts deer can influence the shape of a river.

This demonstrates why ecosystems are difficult to understand through simple, isolated relationships.

Nature works through networks.

The example also has an important implication for sustainability. Environmental management cannot always focus on individual species separately. We need to understand how species interact and how changes in one part of an ecosystem may affect many other parts.

## **The Invisible World Inside Us**

Interdependence is not something that happens only in forests, rivers and oceans.

It is happening inside our own bodies.

The human digestive system contains vast communities of microorganisms. Many of these microorganisms live in relationships with us and contribute to important biological processes, including digestion and other functions.

In return, they receive food and a suitable environment in which to live.

The original article describes the human being as a “walking ecosystem.”

This is a powerful way to think about us.

We normally use the word “I” as though we are completely separate from the biological world. But our existence depends on countless organisms and processes that we cannot see.

Our body is an ecosystem.

Our food comes from ecosystems.

The oxygen we breathe comes through natural systems.

The water we drink passes through natural and human systems.

In this sense, sustainability is not something outside us. It is connected to our very existence.

## **Soil: The Quiet Foundation of Life**

We rarely give much attention to soil. Yet almost every terrestrial food system ultimately depends on it.

Healthy soil contains minerals, organic matter, fungi, bacteria, insects, worms and other organisms.

When leaves fall from trees, they do not simply become waste. They gradually decompose and return nutrients to the soil. Microorganisms play an important role in breaking down organic matter. Plants take up nutrients and use them for growth. Animals eat plants, and eventually their remains return to the soil.

The cycle continues.

This is one of nature’s clearest examples of sustainability: what appears to be waste becomes a resource for another part of the system.

Modern society can learn an important lesson from this natural process.

Instead of thinking only in terms of “take, use and throw away,” we can increasingly think in terms of “use, recover, reuse and regenerate.”

That principle is important not only for agriculture but also for sustainable business and the circular economy.

## **Human Society: We Also Live Through Interdependence**

Interdependence is not limited to biology. Human civilization is built on it.

Think about something as simple as a loaf of bread.

A farmer grows wheat. Workers harvest and process it. Manufacturers produce equipment and packaging. Drivers transport the product. Retailers sell it. Engineers maintain the machines and infrastructure. Financial institutions support transactions. Energy systems keep factories and stores operating.

No single person creates the final product alone.

The same principle applies to almost everything we use.

The original article illustrates this through the connections between a farmer, truck driver, mechanic and teacher.

This also explains why social sustainability matters.

A society cannot remain sustainable if its people, institutions and communities become excessively disconnected or vulnerable.



Sustainable development therefore requires balance among three broad dimensions:

### **Environmental sustainability**

Protecting ecosystems, biodiversity, natural resources and the climate.

### **Economic sustainability**

Creating economic value and prosperity without exhausting the resources required for future generations.

### **Social sustainability**

Building healthy, inclusive and resilient communities in which people can contribute and depend on one another.

These three are not independent.

A damaged environment can weaken the economy. Economic instability can weaken communities. Social instability can make environmental protection more difficult.

Sustainability is therefore a connected system, just like nature itself.

## **What Happens When the Bond Is Broken?**

Interdependence also explains why environmental damage can produce unexpected consequences.

When forests disappear, we lose more than trees. We can lose habitats, soil protection, biodiversity and important water and carbon cycles.

When pollinators decline, agricultural production can be affected.

When soil loses its biological health, farming systems may become less productive and more dependent on external inputs.

When marine ecosystems are damaged, fish populations, coastal communities and food systems may suffer.

The important point is that environmental problems rarely remain confined to one species.

Damage travels through relationships.

The same is true in human systems.

A disruption in one part of a supply chain can affect manufacturers, retailers and consumers. A shortage of one essential input can create consequences far beyond the original problem.

This is why resilience and sustainability require us to understand connections rather than simply treating symptoms.

## **Interdependence and the Future of Sustainability**

The idea of interdependence provides a different way of thinking about the future.

For many years, development was often measured mainly through production, consumption and economic growth. These remain important, but sustainability asks a broader question:

What is the long-term effect of our actions on the systems that support us?

A company depends on natural resources, employees, customers, suppliers and communities.

A city depends on water, energy, food, transportation and ecosystems.

Agriculture depends on soil, water, biodiversity, climate and human knowledge.

Human life depends on all of these systems together.

Sustainability therefore means maintaining the capacity of these systems to continue functioning over time.

It is not about stopping development. It is about developing in a way that does not destroy the foundations on which development itself depends.

As the saying goes:

“We do not inherit the Earth from our ancestors; we borrow it from our children.”

Whether or not we know the exact origin of this widely quoted saying, its message is particularly relevant to sustainability: today's decisions create tomorrow's conditions.



## Seeing the World Differently

Once interdependence becomes visible, ordinary experiences begin to feel different.

A cup of coffee is no longer simply a drink.

It represents soil, rain, sunlight, plants, farmers, workers, processing, transportation and markets.

A meal is not simply food on a plate. It is the result of countless relationships between soil organisms, plants, animals, farmers, pollinators, weather, transport systems and people.

Even a breath becomes a quiet reminder of our connection with the natural world.

The original article describes a meal as a “monument to thousands of unseen partnerships.”

This way of seeing the world can change our behaviour.

We may become more careful about wasting food.

We may think differently about biodiversity.

We may recognise the value of soil and water.

We may appreciate the people whose work supports our daily lives.

And we may begin to understand that sustainability is not merely a government policy or corporate programme.

It is a way of thinking.

## Conclusion: Life Sustains Life

The story of life on Earth is not simply the story of individual organisms fighting to survive.

It is also the story of relationships.

The forest needs its fungi. The flower needs its pollinators. Plants and animals exchange gases. Soil organisms support plant growth. Humans depend on microorganisms, ecosystems and one another.

The examples may be different, but the principle is the same:

### Life sustains life.

Interdependence is therefore more than an interesting scientific concept. It is one of the foundations of sustainability.

If we want a sustainable future, we must understand the relationships that make life possible and avoid damaging them beyond their ability to recover.

Science has given us the language and evidence to understand these relationships, but the relationships themselves are older than human civilisation. As the original article reminds us, “**Life has always needed life.**”

Perhaps the most important lesson is simple:

**We are not separate from nature. We are part of it.**

A sustainable future will depend on recognising this connection—not only between humans and nature, but also between people, communities, businesses and generations.

The invisible bonds that sustain life are everywhere.

**We simply have to learn to see them, value them and protect them.** SB



# GANESH CHATURTHI: A JOURNEY FROM INNER OBSTACLES TO EMOTIONAL HEALING

**Geeta Joshi Brahme**  
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Part: VII

## Abstract

Ganesh Chaturthi is not only a festival of devotion and celebration, but also an opportunity for inner reflection, mindfulness and emotional renewal. The symbolism of Lord Ganesha offers meaningful lessons in wisdom, adaptability, listening, focus and emotional balance. From a Vedic perspective, the festival encourages us to recognise and work through the inner obstacles created by fear, overthinking, attachment and unresolved emotions. The ritual of Ganesh Visarjan beautifully represents acceptance, impermanence and the art of letting go. Creating or colouring a Ganesha-inspired mandala can further transform this festive experience into a mindful practice of self-awareness. Through these practices, Ganesh Chaturthi can become a journey from emotional clutter towards greater consciousness, peace and happiness.

## Ganesh Chaturthi: A Journey from Inner Obstacles to Emotional Healing

Ganesh Chaturthi is much more than a festival of celebration. At a deeper level, it can be seen as an invitation to pause, become aware, release what no longer serves us, and create space for happiness within.

Lord Ganesha is traditionally worshipped as Vighnaharta,--the remover of obstacles and Siddhivinayaka,-- the one who guides us towards wisdom and accomplishment. While we often think of obstacles as external problems, some of the biggest obstacles in our lives exist within us: fear, overthinking, anger, guilt, insecurity, emotional attachments and unresolved feelings.

This is where Ganesh Chaturthi can become a beautiful journey of emotional awareness and inner healing.

What does Ganesha teach us about emotional balance?

Look at the symbolism associated with Ganesha.

His large ears remind us to listen more deeply and react less impulsively. Emotional balance begins when we learn to listen,Änot only to others, but also to our own inner voice.

His small eyes represent concentration and the ability to look beyond distractions. In today,Äs world of constant notifications, multitasking and mental noise, this becomes a powerful reminder to develop mindfulness.

His large head represents wisdom and expanded thinking. When we are emotionally overwhelmed, our thinking can become narrow. Ganesha reminds us to pause, observe the situation from a wider perspective and respond with awareness rather than reacting immediately.

His trunk, capable of both strength and delicate movement, beautifully represents adaptability. Emotional strength does not mean becoming rigid or suppressing emotions. It means learning when to be strong and when to be gentle.

And his large belly can symbolically remind us to digest life,Äs experiences,Äboth pleasant and

difficult, rather than carrying every experience as an emotional burden.

## From Vedic wisdom to emotional healing

Indian philosophical traditions place great importance on chitta, the mind-field where thoughts, memories, impressions and tendencies are held. When the mind becomes crowded with unresolved experiences, we may feel restless, anxious or emotionally exhausted.

Ganesh Chaturthi gives us an opportunity to consciously create a pause.

The rituals of cleaning the home, preparing the space, making or bringing Ganesha, chanting, offering flowers and performing aarti create a rhythm. Repetition and focused attention can bring the mind into the present moment.

The practice is not merely about performing a ritual mechanically. It is the awareness behind the ritual that makes it meaningful.

When we sit before Ganesha, we can ask ourselves:

What is disturbing my peace?

What am I holding on to?

Which fear is becoming an obstacle?

What do I need to accept, release or change?

This simple self-inquiry can transform celebration into a moment of emotional reflection.

## The deeper meaning of Visarjan

Perhaps one of the most beautiful teachings comes at the time of Ganesh Visarjan.

We lovingly welcome Ganesha into our homes and hearts, celebrate His presence, and then eventually let Him go.

Symbolically, this can remind us of impermanence and the art of letting go.

Emotional healing often requires exactly this: acknowledging what we feel without becoming permanently attached to it.

We can love someone and still let go.

We can honour our past without living in it.

We can acknowledge pain without allowing it to define our future.

Visarjan becomes a gentle reminder: what comes into our life may eventually change, and learning to release is also a form of inner strength.



## Ganesha and the Mandala: A Circle of Awareness

There is also a beautiful connection between Ganesha worship and mandalas.

A mandala is based on the principle of a sacred centre surrounded by patterns and layers. When we draw or colour a mandala, our attention naturally moves toward symmetry, repetition, rhythm and the centre.

Ganesha too can be contemplated as a symbol of returning to one's inner centre.

During Ganesh Chaturthi, creating a simple Ganesha-inspired mandala can become a mindful practice. Instead of focusing on artistic perfection, one can draw circles, petals and patterns slowly while holding an intention such as:

"I release what disturbs my peace."

"I welcome wisdom and clarity."

"I choose to respond with awareness."

The mandala then becomes more than a drawing, it becomes a visual anchor for mindfulness and self-reflection.

Celebrating Ganesha within:

Perhaps the most meaningful way to celebrate Ganesh Chaturthi is not only to bring Ganesha home, but to invite His qualities into our own consciousness.

Less reaction.

More awareness.

Less fear.

More wisdom.

Less emotional clutter.

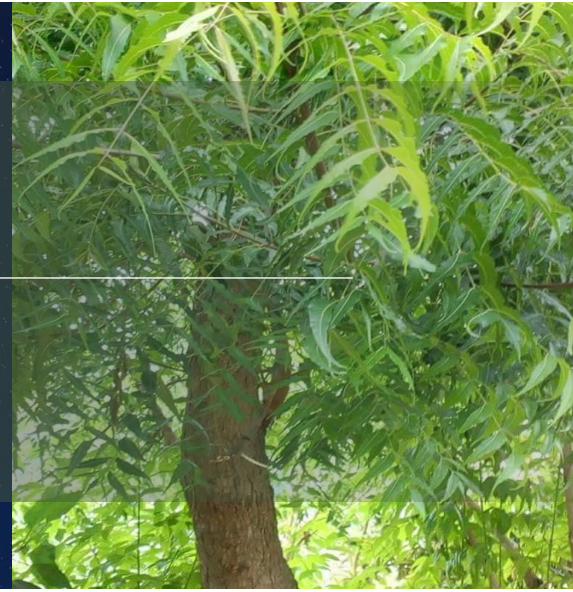
More inner space.

The festival reminds us that removing obstacles is not always about changing the world around us.

Sometimes, the greatest transformation begins when we gently begin removing the obstacles within ourselves. **SB**

## JYESHTHA NAKSHATRA

**Purvi Dalal**  
Industrial Designer



**T**oday we will be talking about Jyeshtha Nakshatra.  
Jyeshtha in Sanskrit means Elder, Senior etc.

So the name suggests that a native of this nakshatra will always be considered as a good advisor.

Such a person is known for his governance abilities, can be in higher authoritative posts, mentorship etc. or a senior in that field.

They will either be very good in positions of Power and responsibility or will evolve only after they learn the lessons of Power and responsibilities.

Scorpio Rashi ends with Jyeshtha Nakshatra which is the last or 9<sup>th</sup> nakshatra in the second group of 9 nakshatras each.

This is therefore an important landmark in the series of 27 nakshatras each - the 18<sup>th</sup> nakshatra.

18 number has great significance

Mahabharat war - 18 days & 18 heroes

Bhagwad Gita - 18 chapters

These natives will always represent power positions and lot of understanding, seniority and protection in their field and other fields too.

The diety here is Lord Indra (Neptune)

- the king of the gods, the god of creation itself.

So such a person can lie or manipulate, diplomatic to achieve his/ her goals but dont take it as a lesson in morality.

They cannot hold a secret so beware before revealing too much to them. Nevertheless they occupy great posts of power, administration and influence.

They are focussed on material projects and work diligently towards their money gosls.

They thrive in adversities but dont get bogged down by them and generally always succeed.

They expect respect from others and earn it too.

The body part impacted is the lower abdomen

(Jyestha nakshatra also represents the bottom part of the scorpion)

They could have the tendency to sting as well.

They are good problem solvers but are susceptible to anger bouts, selfishness or infidelity..... beware.

To counter this weakness they must pray to Lird Vishnu!

They possess a certain maturity and hence can easily work on themselves.

They carry a physique of a well toned body.

Puranas connect the natives of Jyestha to Lord Indra and the tree connected is the Neem Tree.

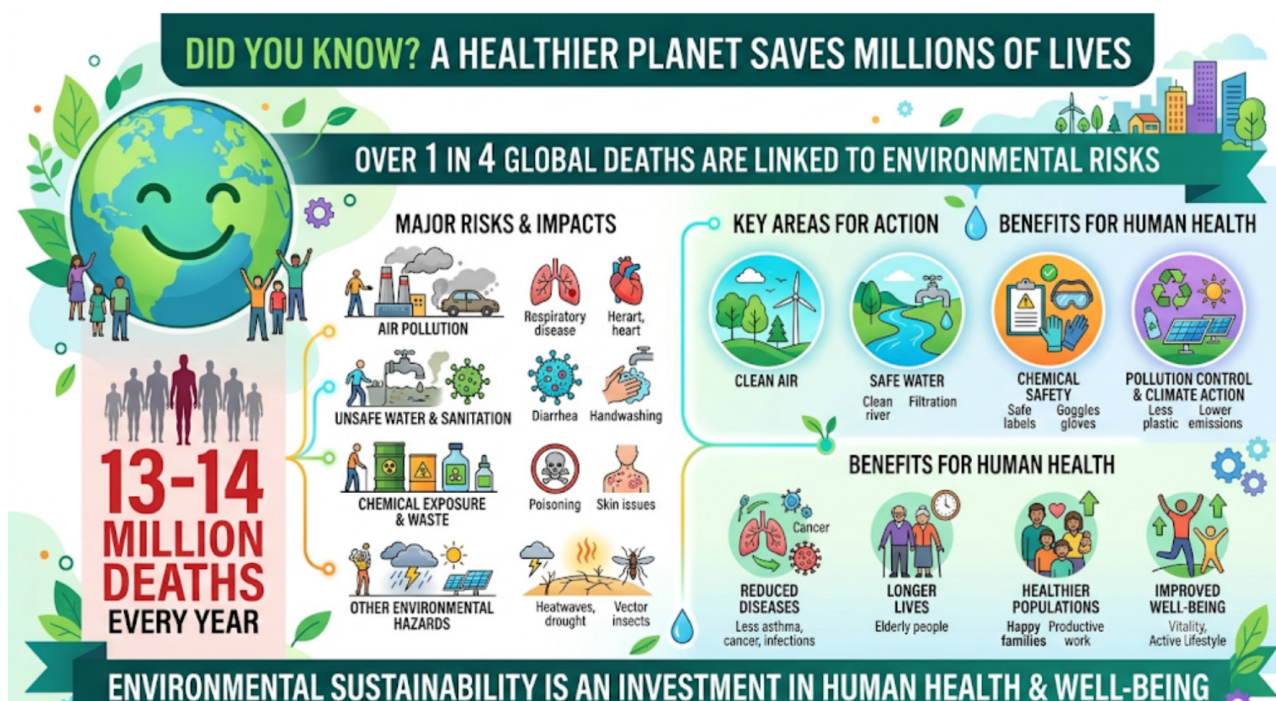
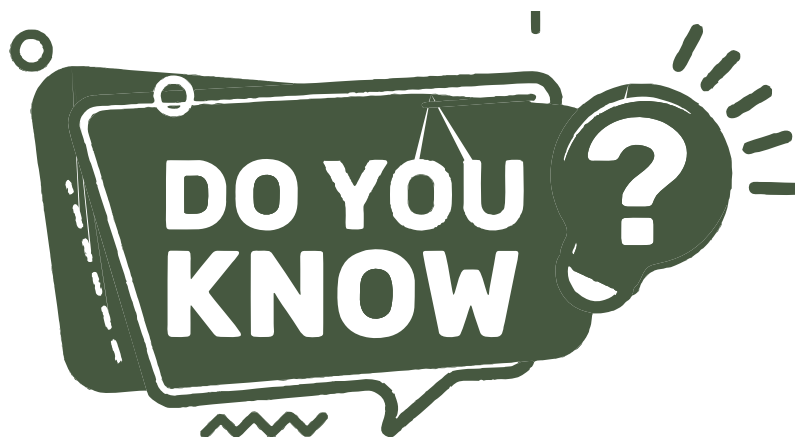
Watering the Neem tree regularly, circumambulating it a few times, worshipping it with the appropriate mantra fulfills all your wishes and removes obstacles of life.

If you worship lovingly, then that deity or entity cannot harm you at all.

Touch, Water and eat a few leaves daily or offer sesame seeds and sugar to its roots and chant the mantra ॐ Indraye Namah.

Please give us your feedback to help us know this methodology helped you. **SB**





Source: Conceptualised & designed by the author using AI tools

A healthier planet can literally save millions of lives. According to the World Health Organization, around one in four deaths globally is linked to environmental risks—equivalent to approximately 13–14 million deaths every year. Air pollution, unsafe water and sanitation, exposure to toxic chemicals, poor waste management and other environmental hazards can significantly affect human

health. This striking fact reminds us that environmental sustainability is not just about protecting nature; it is about protecting human life. Clean air, safe water, responsible chemical management, pollution control and climate action are therefore not merely environmental priorities—they are investments in human health and well-being.

## 5 QUESTIONS ON SUSTAINABILITY

1. Which principle considers both the impact of sustainability matters on a company and the company's impact on society and the environment?
2. What is the term for reducing dependence on virgin resources by keeping materials in use for as long as possible?
3. What term describes the ability of an organisation to withstand and adapt to climate-related disruptions?
4. What term describes the removal of greenhouse gases from the atmosphere through natural or technological processes?
5. What is the term for emissions associated with purchased goods and services in an organisation's value chain?

The names of first 5 participants giving correct responses will be declared in the ensuing newsletter. The responses may be sent to [ssb.newsletters@icmai.in](mailto:ssb.newsletters@icmai.in)



### CORRECT ANSWERS OF AUGUST QUIZ

|   |                                                                                           |
|---|-------------------------------------------------------------------------------------------|
| 1 | Sustainability-related financial disclosures affecting an entity's prospects              |
| 2 | It covers emissions across an organisation's value chain                                  |
| 3 | Biodiversity and nature-related risks                                                     |
| 4 | Significant environmental and social impacts can occur outside a company's own operations |
| 5 | Measuring and analysing environmental costs and resource consumption                      |



### LAST MONTH WINNER

**CMA VVS Pavan Sai**

## CALL FOR ARTICLES

*Sukhinobhavantu* is inviting articles on the theme ESG/ Sustainability or related themes for publishing in October 2026 edition. The articles should be relevant and original. The article should clearly cover/depict the scope, opportunity and potential for cost accountants. It should not exceed 2200 words and references/ sources are to be given wherever required. It should reach us latest by October 14, 2026, by email to [ssb.newsletters@icmai.in](mailto:ssb.newsletters@icmai.in). The right for selection of articles vests with SSB. Decision of SSB will be final and binding.



Your talent our pride!

# GREAT NEWS FOR CHILDREN!

Your Drawing Can Be Featured in

## Sukhinobhavantu

Hello Little Artists! We are happy to invite children aged 6 to 12 years to share their creativity for the Newsletter Sukhinobhavantu.

### What Can You Draw?

Children may create drawings based on **any** of the following ideas:

 Nature

 Kindness

 Family

 Peace

 Love

 Harmony

 Patriotism

 Friendship

 Anything that makes the world a joyful place 

### Drawing Instructions (Very Important)

- ☒ Use an A4 size page
- ☒ Keep a 20 mm header & 20 mm footer
- ☒ Stay within the central area
- ☒ Do **NOT** draw in the header or footer

### Review & Decision:

The artwork will be reviewed collectively, and the decision of the Reviewing Authority shall be final and binding.

Please feel free to contact

**Aditi Didi**

 [ssb.newsletters@icmai.in](mailto:ssb.newsletters@icmai.in)

Pick up your colours, pencils, and crayons, and  
Let your **imagination** bring joy to the world! 





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