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॥ सुखिनोभवंतु ॥

(A Monthly Newsletter of Sustainability Standards Board)

The Institute of Cost Accountants of India

(Statutory body under an Act of Parliament)

www.icmai.in

Behind every successful business decision, there is always a CMA

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Message From Chairman, SSB

"Progress is impossible without change, and those who cannot change their minds cannot change anything." -George Bernard Shaw

The Sustainability Standards Board (SSB) continues to actively engage members and stakeholders in building awareness around sustainability. In our ongoing efforts, we are pleased to announce several key initiatives and activities planned for the coming days.

In collaboration with the International Affairs Committee, the SSB will host a four-part webinar series titled "Global Sustainability Opportunities: Gulf Perspective", beginning 1st July 2025.

This series will explore the business and regulatory environment in Middle East Countries, scope and need for sustainability and climate action, alignment with Sustainable Development Goals (SDGs), roles for professionals in sustainability integration and key insights on ISS 1 and ISS 2

We encourage all members to attend this insightful series to better understand sustainability practices and opportunities in the Middle East and the role professionals can play in driving this agenda forward.

We have completed the admissions for the 4th Batch of the Certificate Course on ESG, with classes commencing on 28th June 2025. The course, updated with a revised syllabus, offers a three-month deep dive into Environmental, Social, and Governance (ESG) principles with leading sustainability experts. We wish the new batch a rewarding and enriching learning experience for the participants.

We are delighted to present the 23rd volume of *Sukhinobhavantu*, our monthly sustainability newsletter. This edition features a new column: "Voices of Science: Real Ideas for Real Sustainability"

This month's theme discusses hydrogen as a renewable energy source, kicking off a new series dedicated to scientific perspectives on sustainability. We hope our readers will enjoy this fresh addition and continue to support our evolving content.

The Exposure Drafts of the Guidance Notes for ISS 1 and ISS 2 have been published. The final versions will be released soon for the benefit of all stakeholders. Your feedback is welcome and appreciated.

The SSB will announce the Best Article Award for contributions published between October 2024 to September 2025. An independent and thorough evaluation process will determine the winners. Stay tuned for details on the review criteria and final results in upcoming issues.

Our fortnightly webinar series under the theme *"Vasudhaiva Kutumbakam"* continues through August 2025. This series features a diverse range of topics covering sustainability and related domains. Flyers for upcoming sessions are available in this issue.

We invite all members and stakeholders to participate actively.

For queries, suggestions, or to share your thoughts, please connect with us at ssb@icmai.in. We look forward to your continued engagement and support in advancing sustainability initiatives.

CMA (Dr.) Ashish P.Thatte
Chairman
Sustainability Standards Board
The Institute of Cost Accountants of India (ICMAI)
June 25, 2025

SDGs and Goal wise Status Report of Indian States (Part-IX)

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The Sustainable Development Goals (SDGs) provide a comprehensive framework to assess the social, economic, and environmental progress of states. The SDG wise status of three states Sikkim, Tamil Nadu and Tripura showcase varied strengths and challenges across these goals, reflecting their unique developmental contexts. This analysis highlights key performance indicators across SDGs 1 to 16, offering insights into areas of success and those requiring focused attention. Understanding these dynamics is crucial for driving inclusive and sustainable growth in each state.

Critical Review: Performance Indicators of SDG:

SDG-1 (No Poverty)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Head Count ratio as per the Multidimensional Poverty Index (%)	2.60	2.20	13.11	14.96
% of households with any unusual member covered by a health scheme or health Insurance	28.00	66.50	36.40	41.00
Persons offered employment as a % of person who demanded employment under- MENREGA	99.98	100.00	99.99	99.74
% of population (out of total eligible) receiving social protection benefits under PMMVY	0.19	197.70	Null	46.29
% of household living in kachha houses	1.50	2.10	1.30	4.60
SDG-1 Index score	66.00	92.00	91.00	72.00
Indicators	**Odisha**	**Punjab**	**Rajasthan**	**India**
Head Count ratio as per the Multidimensional Poverty Index (%)	15.68	4.75	15.31	14.96
% of households with any unusual member covered by a health scheme or health Insurance	47.90	25.20	87.80	41.00
Persons offered employment as a % of person who demanded employment under- MENREGA	99.92	99.92	99.95	99.74
% of population (out of total eligible) receiving social protection benefits under PMMVY	Null	117.84	47.08	46.29
% of household living in kachha houses	11.30	1.10	3.50	4.60
SDG-1 Index score	**73.00**	**84.00**	**82.00**	**72.00**

Performance:

Sikkim

- Strengths:
  - Low multidimensional poverty at 2.60%, showing strong performance in education, health, and living standards.
  - Very high MGNREGA employment coverage (99.98%).
  - Low proportion of households in kachha houses (1.5%) reflects decent housing infrastructure.
- Weaknesses:
  - Very poor health insurance coverage (28%) — a major gap in social protection.
  - Negligible PMMVY benefit coverage (0.19%) reflects lack of maternity support.

Tamil Nadu

- Strengths:
  - Lowest multidimensional poverty (2.20%) among the three states — excellent achievement.
  - Universal MGNREGA employment (100%) and very high PMMVY coverage (197.7%) indicate strong outreach and administrative efficiency.
  - High insurance coverage at 66.5% is impressive.
- Weaknesses:
  - Slightly higher percentage of kachha houses (2.1%) compared to others, but still low.

Tripura

- Strengths:
  - Near-universal MGNREGA coverage (99.99%) and low % of kachha houses (1.3%) show good basic service coverage.
- Weaknesses:
  - High multidimensional poverty at 13.11% — significantly higher than the other two states.
  - Low health insurance coverage (36.4%) and missing PMMVY data, suggesting data or implementation gaps.

SDG-2 (Zero Hunger)

Indicators	Sikkim	Tamil Nadu	Tripura	India
% of beneficiaries covered under NFSA, 2013	93.78	99.84	97.65	99.01
% of children under 5 years who are underweight	13.10	22.00	25.60	32.10
% of children under 5 years who are stunted	22.30	25.00	32.30	35.50
% of pregnant women aged 15-49 years who are anaemic	40.70	48.20	61.50	52.20
% of women (aged 15-49 years) whose BMI below 18.5	5.80	12.60	16.20	18.70
Rice and wheat produced per unit area (3 years average) (kg/ha)	1,849.83	3,564.23	3,080.70	3,052.30
Gross value Added (constant price) in agriculture per worker (in lakhs/worker)	1.01	1.05	1.52	0.86
SDG-2 Index score	**77.00**	**75.00**	**63.00**	**57.00**

Performance:

Sikkim

- Strengths:
  - Lowest % of underweight (13.1%) and stunted children (22.3%), indicating better child nutrition.
  - Lowest percentage of women with low BMI (5.8%) shows good maternal nutrition.
  - High food security with 93.78% NFSA coverage
- Weaknesses:
  - Lowest crop productivity (1,849.83 kg/ha) compared to others.
  - Anaemia in 40.7% of pregnant women still concerning.

Tamil Nadu

- Strengths:
  - Highest food production (3,564.23 kg/ha) reflects agricultural strength.
  - Almost universal NFSA coverage (99.84%) ensures strong food security.
- Weaknesses:
  - High levels of anaemia (48.2%) and underweight children (22%) still challenge health outcomes.
  - 12.6% women with low BMI, needing nutritional interventions.

Tripura

- Strengths:
  - Best agriculture value added per worker (₹1.52 lakh), showing good economic output per farmer.
  - Very high NFSA coverage (97.65%).
- Weaknesses:
  - Highest child malnutrition with 32.3% stunted and 25.6% underweight.
  - Very high anaemia (61.5%) in pregnant women and BMI issues (16.2%) among women.

SDG-3 (Good Health & Well-being)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Maternal Mortality Ratio (per 100,000 live birth)	Null	54.00	Null	97.00
Under 5 Mortality Rate (per 1,000 live births)	Null	13.00	Null	32.00
% of children in the age group 9-11 months fully immunised	65.47	85.13	98.00	93.22
Tuberculosis case notification against target in %	93.00	78.23	86.40	87.13
HIV incidence per 1,000 uninfected population	0.03	0.03	0.18	0.05
Life expectancy	Null	73.20	Null	70.00
Suicide rate (per 100,000 population)	43.10	25.90	17.30	12.40
Death rate due to road traffic accidents (per 100,000 population)	14.33	23.31	5.85	12.40
% of institutional deliveries out of the total deliveries reported	99.46	99.98	98.21	97.18
Monthly per capita out-of-pocket expenditure on health as a share of MPCE	Null	9.10	14.20	13.00
Health worker density per 1,00,000 population	49.35	86.51	38.14	49.45
SDG-3 Index score	**66.00**	**77.00**	**79.00**	**77.00**

Performance:

Sikkim

- Strengths:
  - High institutional deliveries (99.46%), ensuring maternal and infant care.
  - Strong TB case notification (93%) shows robust disease surveillance.
  - Low HIV incidence (0.03) reflects effective prevention measures.
- Weaknesses:
  - Low full immunization rate (65.47%) compared to others.
  - Highest suicide rate (43.10 per 100,000) is a critical concern.
  - Health worker density (49.35) slightly below the national average.

Tamil Nadu

- Strengths:
  - Best maternal (MMR: 54) and under-5 mortality rates (13), well below national levels.
  - High immunization (85.13%) and near-universal institutional delivery (99.98%).
  - Highest health worker density (86.51) supports service delivery.
- Weaknesses:
  - Suicide rate (25.9) remains high.
  - Tuberculosis case notification (78.23%) is below national average.

Tripura

- Strengths:
  - Best SDG-3 score (79) among the three states.
  - Highest full immunization coverage (98%).
  - Lowest suicide (17.3) and road traffic death rate (5.85).
- Weaknesses:
  - Higher HIV incidence (0.18) than both Sikkim and Tamil Nadu.
  - Health worker density (38.14) is the lowest, indicating workforce shortage.
  - Out-of-pocket expenditure (14.2%) higher than Tamil Nadu and India average.

SDG-4 (Quality Education)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Adjusted Net Enrolment Rate in elementary education (clss 1-8) (%)	85.20	99.50	100.00	96.50
Average annual dropout rate at secondary level (class 9-10)	11.90	4.50	8.30	12.60
Gross Enrolment Ratio in higher secondary (class 11-12) (%)	64.20	81.50	56.30	57.60
% of students in garde VII achieving at least a minimum proficiency level in terms of nationally delined learning outcomes to the pupils at the end of the grade	75.00	67.00	77.00	77.23

Indicators	Sikkim	Tamil Nadu	Tripura	India
Gross enrolment Ratio in higher education (18-23 years)	38.60	47.00	20.70	28.40
% of persons with disability (15 years and above) who have completed at least secondary education	20.40	19.10	13.40	19.30
Gender Parity Index for higher education (18-23 years)	1.21	1.01	0.89	1.01
% of persons 15 years and above who are literate	85.40	83.90	92.20	76.70
% of schools with access to basic infrastructure (electricity and drinking water both)	99.13	100.00	53.48	88.65
% of Schools with computers	89.90	78.40	32.60	47.50
% of trained teacher at secondary level (class 9-10)	83.20	99.90	86.10	92.20
Pupil Teacher ratio at secondary level (clss 9-10)	9.00	13.00	14.00	18.00
SDG-4 Index score	**67.00**	**76.00**	**52.00**	**61.00**

Performance:

Sikkim

- Strengths:
  - High access to infrastructure (99.13% schools with electricity & water).
  - Excellent computer availability in schools (89.90%).
  - Strong literacy rate (85.4%) and trained teachers (83.20%).
  - Gender Parity Index (1.21) favours female participation in higher education.
- Weaknesses:
  - High dropout rate at secondary level (11.9%).
  - Low gross enrolment in higher education (38.6%) compared to Tamil Nadu.

Tamil Nadu

- Strengths:
  - Top performer in enrolment indicators: Elementary (99.5%), Higher Secondary (81.5%), and Higher Education (47%).
  - 100% infrastructure coverage and nearly 100% trained teachers.
  - Balanced gender parity (1.01) and decent computer access (78.4%).
- Weaknesses:
  - Learning outcome for Grade VII students (67%) slightly below the national average (77.23%).
  - Lower literacy rate (83.9%) than Tripura.

Tripura

- Strengths:
  - Highest learning proficiency (77%) and literacy rate (92.2%) among the three.
  - Strong performance in teacher training (86.1%) and moderate dropout rate (8.3%).
- Weaknesses:
  - Very poor infrastructure access in schools (53.48%) and low computer availability (32.6%).
  - Weak enrolment in higher education (20.7%) and gender parity (0.89).

SDG-5 (Gender Equality)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Sex ratio at birth	969.00	878.00	1,028.00	920.00
Ration of female to male average wage/ salary earnings received among regular wage/ salaried employees	0.82	0.76	0.69	0.76
% of ever married women aged 18-19 years who have ever experience spousal violence (physical/ sexual)	12.40	38.10	37.20	29.20
Ratio of the female to male Labour Force Participantions Rate (15-19 years)	0.84	0.54	0.62	0.48
Proportion of women in managerial positions including women in board of directors, in listed companies (per 1,000 persons)	Null	190.18	208.60	210.24
% of currently married women aged 15-49 years who have their demand for family planning satisfied by any modern method	67.80	86.10	89.40	74.10
% of female operated operational land holdings	6.29	19.65	23.00	13.96
% of women (aged 15-49 years) who owns a mobile phone that they themselves use	88.60	74.60	60.00	53.90
% of currently married women (aged 15-49 years) who usually participate in three household decisions	89.70	92.80	87.20	88.70
SDG-5 Index score	**66.00**	**53.00**	**49.00**	**49.00**

Performance:

Sikkim

- Strengths:
  - High female mobile phone ownership (88.6%) and decision-making participation (89.7%).
  - Lowest incidence of spousal violence (12.4%) among the three states.
  - Strong labour force participation ratio (0.84) and favorable wage parity (0.82).
- Weaknesses:
  - Very low female land ownership (6.29%).
  - Lack of data on managerial positions for women.
  - Slightly below-national-average family planning access (67.8%).

Tamil Nadu

- Strengths:
  - Highest participation of women in household decision-making (92.8%).
  - High access to family planning (86.1%) and moderate representation in managerial roles (190.18 per 1,000).
- Weaknesses:
  - Low sex ratio at birth (878) — significantly below national average.
  - High spousal violence rate (38.1%) and low female labour participation (0.54).
  - Moderate wage parity (0.76), aligned with national average.

Tripura

- Strengths:
  - Best sex ratio at birth (1,028) — highest among all.
  - High family planning satisfaction (89.4%) and female land ownership (23%).
- Weaknesses:
  - Low mobile phone ownership among women (60%).
  - High spousal violence prevalence (37.2%).

SDG-6 (Clean Water and Sanitation)

Indicators	Sikkim	Tamil Nadu	Tripura	India
% of rural household getting safe and adequate drinking water within premises through PWS	88.56	81.87	78.91	75.75
% of rural population having improved source of drinking water	100.00	100.00	96.46	99.29
% of individual household toilets constructed against target	100.00	100.00	100.00	100.00
% of districts verified to be ODF	100.00	100.00	100.00	100.00
% of schools with functional girls toilets	99.20	99.60	74.60	94.70
Stage of ground Water extraction (%)	5.54	73.91	9.92	50.30
% of block/ mandals/ taluka over-exploited	–	31.95	–	11.23
SDG-6 Index score	**97.00**	**90.00**	**82.00**	**88.00**

Performance:

Sikkim

- Strengths:
  - 100% access to improved drinking water sources, household toilets, and verified ODF districts.
  - High percentage (99.2%) of schools with functional girls' toilets.
  - Exceptionally low groundwater extraction (5.54%) — indicates sustainability.
- Weaknesses:
  - Slightly lower safe drinking water access within premises (88.56%) compared to full coverage.
  - No data on over-exploited blocks, which limits groundwater risk assessment.

Tamil Nadu

- Strengths:
  - Universal access to improved drinking water, household toilets, and ODF verification.
  - Near-complete girls' toilet coverage in schools (99.6%).
- Weaknesses:
  - Very high groundwater extraction (73.91%) — unsustainable and a red flag for water security.
  - 31.95% blocks over-exploited, indicating severe groundwater stress.
  - Comparatively lower household-level safe water access (81.87%).

Tripura

- Strengths:
  - 100% coverage in key sanitation indicators: toilets, ODF districts.
  - Low groundwater extraction (9.92%) — indicates sustainable water use.
- Weaknesses:
  - Low percentage of schools with girls' toilets (74.6%) — significant gendered gap.
  - Safe drinking water access within premises is lower (78.91%).
  - No data on over-exploited blocks, which limits complete risk analysis.

SDG-7 (Affordable and Clean Energy)

Indicators	Sikkim	Tamil Nadu	Tripura	India
% of Household Electrification	100.00	100.00	100.00	100.00
% of LPG/ PNG Connections against no. of Households	86.24	102.94	78.37	96.35
SDG-7 Index score	**83.00**	**100.00**	**74.00**	**100.00**

Performance:

Sikkim

- Strengths:
  - Achieved 100% household electrification, ensuring universal access to electricity.
- Weaknesses:
  - LPG/PNG connections stand at 86.24%, indicating that over 13% of households still rely on traditional or less clean fuels.

Tamil Nadu

- Strengths:
  - Perfect performance on both indicators — 100% household electrification and LPG/PNG coverage exceeding households (102.94%), possibly due to multiple connections or data lag.
- Weaknesses:
  - No visible weaknesses in the current indicators, though over-reliance on fossil LPG could be a future concern unless paired with a clean energy transition plan.

Tripura

- Strengths:
  - Also achieved 100% electrification, a major milestone for an NE state with hilly terrain.
- Weaknesses:
  - Only 78.37% LPG/PNG coverage, leaving over 21% of households potentially using biomass or inefficient fuels.

SDG-8 (Decent Work and Economic Growth)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Annual growth rate of GDP (constant prices) per capita (%)	5.44	7.87	7.80	5.88
Unemployment rate (%) (15-59 years)	2.40	4.80	1.50	3.40
LFPR (%) (15-59 years)	78.10	62.30	60.40	61.60
% of regualar wage/ salaried employees in non-agricultural sector without any social security	55.20	48.50	51.20	53.90
% of households with any unusual number with a bank or post office	91.80	96.60	96.60	95.70
Number of functioning branches of commercial banks 1,00,000 population	25.47	16.68	15.04	11.75
Automated Teller Machines per 1,00,000 population	35.40	39.05	15.97	18.30
% of women account holders in PMJOY	52.81	58.59	55.92	55.63
SDG-8 Index score	**84.00**	**81.00**	**74.00**	**68.00**

Performance:

Sikkim

- Strengths:
  - Highest Labour Force Participation Rate (LFPR) at 78.1% and a low unemployment rate (2.4%) suggest strong workforce engagement.
  - Better access to banking services (91.8% households linked to banks) and high ATM density (35.4 per 1L population).
- Weaknesses:
  - Over 55% of salaried workers lack social security, indicating informal employment remains a concern.

Tamil Nadu

- Strengths:
  - Strong economic growth rate (7.87%), high female PMJDY account ownership (58.59%), and robust banking reach.
  - Highest ATM density at 39.05 per 1 lakh population.
- Weaknesses:
  - Lower LFPR (62.3%) and relatively higher unemployment rate (4.8%).
  - 48.5% of workers still lack social security.

Tripura

- Strengths:
  - Lowest unemployment rate (1.5%), indicating high job absorption.
  - Good coverage of PMJDY and banking inclusion (96.6% households).
- Weaknesses:
  - Low LFPR (60.4%), lowest bank branch and ATM density, and lower per capita financial infrastructure.

SDG- 9 (Industry, Innovation, and Infrastructure)

Indicators	Sikkim	Tamil Nadu	Tripura	India
% of targeted habitations connected by all-weather roads under PMGSY	100.00	100.00	98.70	99.70
% of Share of GVA in Manufacturing to total GVA (current price)	35.68	20.43	3.21	14.34
Manufacturing employment as a % of total employment	3.39	16.77	3.12	11.42
% of Share of GVA in Services to total GVA (current price)	28.58	53.05	45.15	54.18
Services employment as a % of total employment	39.22	33.98	39.31	27.75
Innovation score as per the India Innovation Index	13.85	15.69	11.43	36.40
% of households that own at least one mobile phone	95.70	92.80	91.50	93.30
% of inhabited villages with 3G/4G mobile internet coverage	93.49	98.00	64.78	95.08
SDG-8 Index score	**55.00**	**67.00**	**30.00**	**61.00**

Performance:

Sikkim

- Strengths:
  - 100% coverage of habitations by all-weather roads under PMGSY.
  - High mobile ownership (95.7%) and good internet coverage (93.49% villages).
  - Strong manufacturing GVA share (35.68%), the highest among the three.
- Weaknesses:
  - Despite high manufacturing output, only 3.39% of employment is in manufacturing.
  - Innovation Index score is moderate (13.85).

Tamil Nadu

- Strengths:
  - Highest SDG-9 score (67) among the three, showing balanced industrial growth.
  - Strong in services GVA (53.05%), manufacturing employment (16.77%), and innovation score (15.69).
  - Excellent digital infrastructure – 98% mobile internet coverage.
- Weaknesses:
  - Manufacturing GVA (20.43%) is lower than Sikkim's, indicating less capital-intensive industry.
  - Slightly lower mobile phone ownership (92.8%) compared to Sikkim.

Tripura

- Strengths:
  - High employment in services (39.31%) and decent mobile ownership (91.5%).
- Weaknesses:
  - Very low manufacturing contribution to GVA (3.21%) and employment (3.12%).
  - Lowest innovation score (11.43) and weak digital infrastructure – only 64.78% of villages have 3G/4G.

SDG-10 (Reducing Inequalities)

States	Gini coefficient	% of seats held by women in PRIs	% of SC/ST seats in State Legislative Assembly	Ration of % of female workers to male workers working as professionals and Technical Workers	Rate of total crimes against SCs (per 1,00,000 SC population)	Rate of total crimes against STs (per 1,00,000 ST population)	SDG-10 Index score
Odisha	0.23	52.68	38.78	55.60	40.40	8.10	61.00
Punjab	0.10	41.79	29.06	60.00	1.80	Null	77.00
Rajasthan	0.18	51.23	29.50	32.20	71.60	27.30	49.00
India	0.20	45.61	28.57	50.40	28.60	9.60	86.00

Performance:

Sikkim

- Strengths:
  - High representation of SC/ST in the State Legislative Assembly (43.75%).
  - Gender parity in technical/professional work: female-to-male ratio is 71.9%, highest among the three.
  - Low income inequality: Gini coefficient of 0.14.
- Moderate crime rates against SC (10.6) and ST (1.9) populations.

Tamil Nadu

- Strengths:
  - Lowest income inequality (Gini = 0.10).
  - Highest % of women in PRIs (52.99%), reflecting political inclusion.
- Weaknesses:
  - Low representation of SC/ST (19.66%) in the State Legislative Assembly.
  - Higher crime rates against SCs (12.2) and STs (8.4).
  - Lower female participation in professional/technical roles (59%).

Tripura

- Strengths:
  - Highest representation of SC/STs (50%) in the Assembly.
  - Lowest crime rates against SCs (0.3) and STs (0.3) among all.
  - High gender parity in technical/professional workers (72%).
- Weaknesses:
  - Highest Gini coefficient (0.20) – indicates higher income inequality.
  - Lower share of seats held by women in PRIs (45.23%).

SDG-11 (Sustainable Cities and Communities)

Indicators	Sikkim	Tamil Nadu	Tripura	India
% of urban households living in kachha house	1.00	0.90	4.40	0.90
% of individual household toilets constructed against target SBM (U)	98.11	123.31	115.37	95.29
Deaths due to road accidents in urban areas (per 1,00,000 population)	3.98	12.54	4.79	12.68
% of wards with 100% door to door waste collection (SBM(U))	100.00	99.87	100.00	97.00
% of MSW processed to total MSW generated (SBM(U))	73.20	65.11	97.32	78.46
% of wards with 100% source segregation (SBM(U))	100.00	99.87	100.00	90.00
Installed sewage treatment capacity as a % of sewage generated in urban area	57.69	23.24	3.38	51.00
SDG-11 Index score	**88.00**	**81.00**	**80.00**	**83.00**

Performance:

Sikkim

- Strengths:
  - 100% waste collection and source segregation in all wards.
  - High performance in sewage treatment capacity: 57.69% (above national average of 51%).
  - Low deaths due to urban road accidents: 3.98 per lakh.
  - Only 1% urban households in kachha houses, reflecting good urban housing quality.
- Weaknesses:
  - Slightly below national average in municipal solid waste (MSW) processing (73.2% vs India's 78.46%).

Tamil Nadu

- Strengths:
  - Excellent coverage of urban sanitation:
    - 123.31% of target household toilets constructed.
    - 99.87% door-to-door waste collection and source segregation.
  - Very low percentage (0.9%) of urban kachha houses.
- Weaknesses:
  - Lowest sewage treatment capacity: Only 23.24% treated.
  - High urban road accident death rate: 12.54 per lakh, nearly thrice that of Sikkim.

Tripura

- Strengths:
  - 100% waste collection and source segregation, like Sikkim.
  - MSW processing is the best among the three: 97.32%.
  - Overachievement in toilet construction: 115.37% of target.

- Weaknesses:
  - Very poor sewage treatment capacity: Just 3.38%.
  - Slightly higher percentage of kachha houses (4.4%) compared to others.

SDG-12 (Responsible Consumption & Production)

States	Per capita fossil fuel consumption (in kg)	% use of Nitrogeneous fertiliser out of total NPK	Quality of hazardous waste recycled/ utilised to total hazardous waste generated (%)	Plastic waste generated per 1,000 population (MT/ Annum)	% of Bio Medical Waste (BMW) treated to total quantitiy of BMW generated	SDG-12 Index score
Sikkim	217.19	–	–	0.12	100.00	**75.00**
Tamil Nadu	200.75	59.84	48.81	5.64	100.00	**78.00**
Tripura	64.10	58.42	48.81	12.57	100.00	**75.00**
India	166.43	65.24	54.90	3.04	91.52	**78.00**

Performance:

Sikkim

- Strengths:
  - 100% treatment of Bio-Medical Waste (BMW) — perfect compliance.
  - Lowest plastic waste generation: Only 0.12 MT per 1,000 population, indicating strong awareness and sustainable plastic use.
- Weaknesses:
  - No reported data for nitrogenous fertilizer usage or hazardous waste recycling, possibly due to lower industrial activity.
  - Relatively higher fossil fuel consumption (217.19 kg per capita), possibly due to terrain-related transport needs.

Tamil Nadu

- Strengths:
  - 100% BMW treatment — strong waste infrastructure.
  - Data available for all indicators, showing institutional monitoring.
- Weaknesses:
  - Highest per capita plastic waste: 5.64 MT, indicating room for better plastic waste management.
  - Low hazardous waste recycling/utilization: 48.81%, needs improvement.
  - High nitrogenous fertilizer share (59.84%)—could indicate an imbalance in NPK application.

Tripura

- Strengths:
  - Lowest fossil fuel use: Only 64.10 kg per capita, indicating greener energy or lower motorization.
  - 100% BMW treatment – same as other two states.

- Weaknesses:
  - Highest plastic waste per 1,000 population: 12.57 MT – significantly above others.
  - Same low hazardous waste utilization (48.81%) as Tamil Nadu.
  - High nitrogenous fertilizer share (58.42%) – slightly better than Tamil Nadu but still indicates possible overuse.

SDG-13 (Climate Action)

States	No. of human lives lost per 1 crore population due to extreme weather events	Disaster preparedness score as per Disaster Resilience Index	% of renewable energy out of total installed generation capacity (including allocated shares)	DALY rate attributable to air pollution (per 1,00,000 population)	% of industries complying with environmental standards	SDG-13 Index score
Sikkim	45.52	16.00	87.04	1,620.00	100.00	**81.00**
Tamil Nadu	12.85	24.50	56.19	2,412.00	99.34	**81.00**
Tripura	55.51	22.50	16.03	3,589.00	88.04	**61.00**
India	15.44	19.20	43.28	3,469.00	94.86	**67.00**

Performance:

Sikkim

- Strengths:
  - Highest share of renewable energy in total generation capacity: 87.04% – excellent clean energy leadership.
  - Perfect industrial compliance with environmental standards: 100%.
  - Lowest air pollution impact (DALY rate): 1,620 per 1,00,000 – indicating better air quality.
- Weaknesses:
  - Disaster preparedness score is the lowest (16.00) among the three states.
  - Moderate human lives lost due to extreme weather (45.52 per crore) – higher than Tamil Nadu.

Tamil Nadu

- Strengths:
  - Best disaster preparedness score among all states: 24.50.
  - Very high compliance with environmental standards: 99.34%.
  - Lowest number of human lives lost due to extreme weather: 12.85 per crore – commendable climate resilience.
- Weaknesses:
  - Air pollution DALY relatively high: 2,412, needs stronger pollution control measures.
  - Moderate renewable energy share: 56.19%, better than national average but below Sikkim.

SDG-14 - Life Below Water

Other than Tamil Nadu all other two states are land lock. Hence no comparison is made.

SDG-15 (Life on Land)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Forest cover as a % of total geographical area	47.08	20.31	73.64	21.71
Tree covered as a & of total geographical area	0.55	3.40	2.17	2.91
Combine of las tow	47.63	23.71	75.81	24.62
% of area covered under afforestation schemes to the total geographical area	0.20	0.10	Null	0.40
% change in carbon stock in forest cover	-2.87	-1.00	-1.42	1.11
% of degraded land over total land area	10.75	18.76	9.80	27.77
% of increase in area of desertification	7.44	3.63	2.34	1.50
No. of cases under Wildlife protection Act per million hectares of protected area	Null	40.00	17.00	16.00
SDG-15 Index score	**72.00**	**72.00**	**95.00**	**75.00**

Performance:

Tripura

- Strengths:
  - Highest forest cover among all: 73.64%, combined green cover at 75.81% – leading in biodiversity preservation.
  - Lowest degraded land percentage: 9.80%, indicating better land management.
  - Moderate desertification increase: 2.34%, still above national average but relatively lower than others.
  - Good control on wildlife-related offenses (17 cases vs. India's 16).
- Weaknesses:
  - Carbon stock is declining: -1.42% change – needs carbon sequestration and reforestation strategies.
  - No afforestation data reported.

Sikkim

- Strengths:
  - Very high forest cover: 47.08%, combined with total green cover of 47.63% – well above national average.
  - Afforestation efforts reported (0.20%), indicating commitment to restoration.
  - Low degraded land: 10.75%, better than India and Tamil Nadu.
- Weaknesses:
  - Carbon stock fell the most: -2.87% – needs urgent forest conservation.
  - Desertification rate is high: 7.44%, significantly above national average.
  - Wildlife protection data not reported (Null).

Tamil Nadu

- Strengths:
  - Highest tree cover (3.40%) – urban greening and agroforestry are commendable.
  - Lowest afforestation among states (0.10%), but effort still present.
  - Relatively low increase in desertification: 3.63%.
- Weaknesses:
  - Low forest cover: 20.31%, below the national average.
  - High degraded land: 18.76%, second only to India.
  - Carbon stock reduced by -1.00%.
  - High cases under Wildlife Protection Act: 40 per million ha – possibly due to greater reporting or enforcement needs.

SDG-16 (Peace, Justice, and Strong Institutions)

Indicators	Sikkim	Tamil Nadu	Tripura	India
Murder per 1 lakh population	1.30	2.20	2.60	2.10
Cognizable crimes against children per 1 lakh population	77.20	31.80	17.90	36.60
No. of victims of human trafficking per 10 lakh population	1.46	0.07	–	4.37
No. of mission children per 1,00,000 child population	7.62	33.93	10.24	18.77
No. of courts per 1,00,000 population	5.49	1.85	3.31	1.01
Cases under prevention of Corruption Act and related sections of IPC per 10 lakhs population	2.92	3.40	–	3.00
Charge sheeting rates of IPC crime	55.50	70.70	73.10	71.30
% of children under 5 years whose birth was registered	96.50	98.30	93.80	89.10
% of population covered under Aadhar	84.43	97.94	93.60	95.47
SDG-16 Index score	**83.00**	**78.00**	**82.00**	**74.00**

Performance:

Sikkim

- Strengths:
  - Lowest murder rate: 1.30 per lakh – reflects strong law enforcement and community safety.
  - Highest number of courts per 1 lakh population: 5.49 – ensures better access to justice.
  - High birth registration (96.5%) and Aadhar coverage (84.43%).
- Weaknesses:
  - Very high crimes against children: 77.2 – significantly above national average.
  - Low charge sheeting rate: 55.5%, suggesting weaker legal follow-through.
  - Human trafficking victims reported, though relatively low.

Tamil Nadu

- Strengths:
  - High charge sheeting rate: 70.7%, indicating effective case prosecution.
  - Highest birth registration (98.3%) and excellent Aadhar coverage (97.94%).
  - Very low human trafficking rate (0.07), near-zero.
- Weaknesses:
  - Crimes against children moderately high: 31.8.
  - Lower number of courts (1.85 per lakh) than Sikkim and Tripura.
  - High number of missing children (33.93 per 1 lakh child population) – needs attention.

Tripura

- Strengths:
  - Best charge sheeting rate: 73.1% – reflects robust justice delivery.
  - Low crimes against children: 17.9 per lakh – lowest among peers.
  - Good court coverage (3.31 per lakh) and birth registration (93.8%).
- Weaknesses:
  - No data on human trafficking and corruption cases – a gap in transparency.
  - Slightly higher murder rate (2.60 per lakh), above national average.
  - Aadhar coverage lower than national average.

Composite Performance:

	2023-24			2020-21		
	Sikkim	Tamil Nadu	Tripura	Sikkim	Tamil Nadu	Tripura
SDG-1	66	92	91	80	86	68
SDG-2	77	75	63	69	66	50
SDG-3	66	77	79	62	81	67
SDG-4	67	76	52	58	69	63
SDG-5	66	53	49	58	59	41
SDG-6	97	90	82	89	87	96
SDG-7	83	100	74	100	100	100
SDG-8	84	81	74	71	71	73
SDG-9	55	67	30	52	71	59
SDG-10	88	66	77	61	74	67
SDG-11	88	81	80	85	79	76
SDG-12	75	78	75	76	78	73
SDG-13	81	81	61	65	61	43
SDG-15	72	72	95	73	63	81
SDG-16	83	78	82	72	71	71

Sikkim

- Strengths in 2023-24:
  - Strong improvements in SDG-6 (Water & Sanitation): from 89 → 97
  - Maintained excellence in SDG-11 (Sustainable Cities) and SDG-16 (Peace & Justice): both at 88 and 83, respectively.
  - Notable recovery in SDG-4 (Education): 58 → 67
- Concerns:
  - SDG-7 (Clean Energy) dropped: 100 → 83
  - Marginal decline in SDG-1 (No Poverty): 80 → 66
  - Limited growth in SDG-9 (Industry, Innovation, Infrastructure) and SDG-13 (Climate Action)
- Overall Summary: While Sikkim saw some setbacks in SDG-1 and SDG-7, it showed steady or improved performance in most social and governance indicators.

Tamil Nadu

- Strengths in 2023-24:
  - Maintained high performance in SDG-1 (92), SDG-6 (90), SDG-7 (100), and SDG-8 (81)
  - Notable improvement in SDG-2 (Zero Hunger) and SDG-4 (Education)
- Concerns:
  - Slight dip in SDG-3 (Good Health): 81 → 77
  - SDG-5 (Gender Equality) remains low at 53, slightly below the 2020-21 score
  - Drop in SDG-10 (Reduced Inequality): 74 → 66
- Overall Summary: Tamil Nadu retained a balanced and strong profile with consistent leadership in health, energy, and economic growth, though social inclusion (SDG-5, SDG-10) needs policy attention.

Tripura

- Strengths in 2023-24:
  - Sharp gains in SDG-3 (Health): 67 → 79
  - SDG-4 (Education) improved significantly: 42 → 52
  - SDG-15 (Life on Land) jumped: 69 → 95
- Concerns:
  - Drop in SDG-12 (Sustainable Consumption): 99 → 75
  - SDG-9 (Industry & Innovation) weakened further: 35 → 30
  - Slight decline in SDG-7 (Clean Energy) and SDG-1 (No Poverty)
- Overall Summary: Tripura has improved education, health, and environment, but industrial and infrastructure development remains weak, and sustainability progress slowed in some areas.

Composite Trend Summary

SDG	Sikkim (↓/↑)	Tamil Nadu (↓/↑)	Tripura (↓/↑)
SDG-1	↓ (80 → 66)	↑ (86 → 92)	↑ (82 → 91)
SDG-2	↑ (69 → 77)	↑ (66 → 75)	↑ (52 → 63)
SDG-3	↑ (62 → 66)	↓ (81 → 77)	↑ (67 → 79)
SDG-4	↑ (58 → 67)	↑ (69 → 76)	↑ (42 → 52)
SDG-5	↑ (58 → 66)	↓ (59 → 53)	↑ (39 → 49)
SDG-6	↑ (89 → 97)	↑ (87 → 90)	= (82 → 82)
SDG-7	↓ (100 → 83)	= (100 → 100)	↓ (83 → 74)
SDG-8	↑ (71 → 84)	↑ (71 → 81)	↑ (57 → 74)
SDG-9	↑ (52 → 55)	↓ (71 → 67)	↓ (35 → 30)
SDG-10	↑ (61 → 88)	↓ (74 → 66)	↓ (85 → 77)
SDG-11	↑ (85 → 88)	↑ (79 → 81)	↑ (67 → 80)
SDG-12	↓ (76 → 75)	= (78 → 78)	↓ (99 → 75)
SDG-13	↑ (65 → 81)	↑ (61 → 81)	↑ (41 → 61)
SDG-15	↓ (73 → 72)	↑ (63 → 72)	↑ (69 → 95)
SDG-16	↑ (72 → 83)	↑ (71 → 78)	↑ (80 → 82)

Final Remarks:

- Sikkim shows balanced progress in governance and social indicators but needs a push in industrial innovation and sustainability.
- Tamil Nadu continues to be one of the most consistent high performers, particularly in poverty, health, and energy, though gender equality and equity issues require more focus.
- Tripura is rapidly catching up in health, education, and environmental conservation, but industrial development and sustainability remain weak links.

Each state reflects a unique trajectory, demanding targeted policy attention to their respective areas of weakness, while consolidating on their strengths for holistic SDG achievement.

Conclusion:

Sikkim shows steady progress across most SDGs, with strengths in water, sanitation, and governance, though it needs improvement in industrial innovation and energy sustainability. Tamil Nadu maintains consistent leadership in health, education, and economic indicators but faces challenges in gender equality and reducing inequality. Tripura demonstrates significant gains in health, education, and environmental conservation, but lags in infrastructure and sustainable consumption practices.

Sustainability – A Global Outlook

1. **EU Parliament, Council agree to remove 90% of Companies from CBAM Carbon Import Tax**

   Lawmakers in the European Parliament and Council announced that they have reached an agreement on changes to the carbon border adjustment mechanism (CBAM), the EU's carbon tax on imported goods, including introducing a new threshold to the regulation that would exempt 90% of importers – primarily smaller businesses – from the CBAM rules.

   Read More.....

2. **ECB sets goal to reduce emissions of €331 billion Corporate Bond portfolio by 7% per year**

   The European Central Bank (ECB) announced the publication of a new set of climate-related financial disclosures, providing information on the carbon footprint of its portfolios and their exposure to climate risks, indicating that the carbon intensity of its €331 billion (USD$380 million) corporate bond portfolio has declined by 38% from 2021 to 2024.

   Read More.....

3. **Switzerland, Norway launch landmark Carbon removal and storage agreement**

   The governments of Norway and Switzerland announced a new cross border durable carbon dioxide removal agreement, marking the first-ever international deal to be conducted under Article 6.2 of the Paris Agreement. According to Switzerland and Norway, the new agreement is aimed providing insights into regulatory frameworks, monitoring and reporting, and supporting the development of a sustainable commercial market for carbon capture and storage CCS and CDR, in addition to enabling long-term investment in climate technologies.

   Read More.....

4. **EU Parliament's Omnibus Negotiator proposes much sharper cuts to sustainability reporting regulations**

   Parliament's Omnibus rapporteur Jörgen Warborn of the European People's Party (EPP), announced the publication of draft amendments to the European Commission's proposed "Omnibus" initiative to reduce the sustainability reporting and due requirements, suggesting significantly deeper cuts in the number of companies covered and the reporting obligations of the regulations.The draft will form the basis of the EPP's position in negotiating Parliament's position on the Omnibus proposal, for its own negotiations with the EU Council on the formation of a final package.

   Read More.....

5. **Basel Committee releases Voluntary Framework for Banks' disclosure of climate risks**

   The Basel Committee on Banking Supervision, the primary global standard and policy setter for the banking industry, announced the release of a new, and long-awaited, framework for use by regulators for the disclosure of climate-related risks by banks. Following pressure from the U.S., however, the committee decided to make the framework voluntary, rather than requiring its adoption by regulators, potentially weakening the

initially stated intention of exploring a Pillar 3 disclosure framework for climate-related financial risks.

Read More.....

6. IFRS Foundation launches course to support Companies starting Sustainability Reporting with ISSB Standard

The IFRS Foundation announced the launch of a new e-learning module-based course, aimed at supporting companies in understanding the new International Sustainability Standards Board (ISSB) sustainability and climate-related standards, and to help drive the implementation of the standards According to the IFRS Foundation, the new e-learning course form part of its "ongoing commitment to support the global adoption and implementation of ISSB Standards in response to market demand for practical tools," and were designed as an introductory tool for companies beginning preparation for sustainability-related disclosures, or for other stakeholders interested in learning about the ISSB standards.

Read More.....

7. SEC drops proposed Anti-Greenwashing Fund disclosure rules

The U.S. Securities and Exchange Commission (SEC) announced that it is withdrawing a series of proposed rules initiated during the tenure of former SEC Chair Gary Gensler, including a rule requiring disclosures by investment managers marketing ESG-focused funds aimed at providing consistent information to investors and to avoid greenwashing risk.

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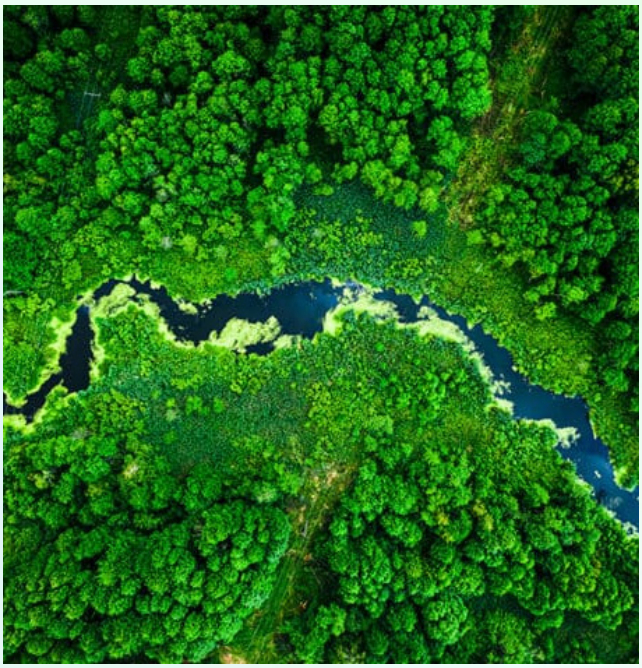
8. Australia launches Sustainable Finance Taxonomy

The Australian Sustainable Finance Institute (ASFI) announced today the release of the Australian sustainable finance taxonomy, a new voluntary classification system for categorizing green and transition-focused



economic activities, aimed at improving transparency and facilitating capital flows towards Australia's climate goals.

Read More.....

9. US climate pullback threatens planned debt-for-nature deals

The U.S. International Development Finance Corporation (DFC) has been a key player, providing political risk insurance for over half of the deals done over the last five years, accounting for nearly 90% of $6 billion of swapped debt.

Read More.....

10. Why extreme weather events are just the tip of the iceberg for Companies in a riskier world

The small town of Spruce Pine in North Carolina (population approximately 2,000) is an unlikely pinch point for the global digital economy. But it is home to the world's largest deposit of high-purity quartz, and supplies about 70% of the mineral used in computing applications.

Read More.....

Sustainability – Indian Context

1. SEBI rolls out framework for Social, Sustainability, and Sustainability-Linked Bonds under ESG Debt Securities

   The Securities and Exchange Board of India (SEBI) has issued a landmark framework for the issuance and listing of ESG debt securities, specifically targeting social bonds, sustainability bonds, and sustainability-linked bonds (SLBs). This new framework, released via circular on June 5, 2025, excludes green bonds, which are already governed by a separate set of rules.

   Read More.....

2. **PM Modi plants Sindoor sapling on occasion of World Environment Day**

   As a wave of patriotic fervour washes over the nation following the success of Operation Sindoor, Prime Minister Narendra Modi planted a sapling of natural Sindoor (vermilion), coinciding with World Environment Day.

   Read More.....

3. **Sustainable development: The rise of green MSMEs**

   Micro-, small- and medium-sized enterprises (MSMEs) in the country are increasingly embracing green practices, as sustainability is fast emerging as a crucial factor for growth, moving beyond just compliance. While still in the early stages, the shift reflects a broader understanding that environmental responsibility and economic success are interconnected.

   Read More.....

4. **Why India is emerging as the ideal hub for GBS and GCCs**

   India has evolved into a global epicenter for Global Business Services (GBS) and Global Capability Centers (GCCs), transitioning from cost-saving offshore centers to strategic innovation hubs. This shift is reshaping the global business landscape, with GCCs driving digital transformation and operational excellence for multinational corporations.

   Read More.....

5. **NSE Sustainability launches ESG ratings for listed companies**

   NSE Sustainability Ratings and Analytics Ltd, an entity of the National Stock Exchange, on Friday announced the launch of its ESG ratings for listed companies.

   Read More.....

6. **GIFT Nifty hits record monthly turnover of $102.35 billion in May 2025**

   GIFT Nifty hit a record monthly turnover of $102.35 billion in May 2025, reflecting rising global investor confidence. Since full operations began in July 2023, cumulative turnover has reached $1.93 trillion across 43 million contracts.

   Read More.....

7. **Tata Steel's green push: eyes 10-15 million tonnes of production through recycling route**

   Tata Steel has announced that the company is aiming to have 10-15 million tonnes of production through recycling route in the

next 10-15 years, a PTI report stated. Tata Steel is adopting low carbon emitting steel making technologies in India and Europe.

Read More.....

8. Government frozen AC temperature limit to minimum 20°C

The Bureau of Energy Efficiency (BEE), which comes under the Ministry of Power, is planning a framework to standardise AC settings between 20 to 28 degrees Celsius. Let's find out the reason behind this significant shift here.

Read More.....

9. Adani Green subsidiary operationalises incremental solar power project of 187.5 MW at Khavda

Adani Green Energy (AGEL) on Wednesday announced that its wholly-owned stepdown subsidiary, Adani Renewable Energy Fifty Seven Limited has operationalised an incremental solar power project of 187.5 MW at Khavda, Gujarat. With the operationalisation of this plant, AGEL's total operational renewable generation capacity has increased to 14,528.4 MW.

Read More.....

10. Bengaluru to have a circular economy innovation cluster for waste

Circularity isn't just about reducing waste—it's about redesigning the system itself. Real innovation emerges when we make local communities as the key stakeholders, rethink the value of waste, and invest in models that prevent waste from being created in the first place.

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CERTIFICATE COURSE ON ESG

Brochure

Sustainability Standards Board

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BROCHURE ON CERTIFICATE COURSE ON ESG (BATCH NO. 4)

Certificate Course on ESG | The Institute of Cost Accountants of India

About The Institute

The Institute of Cost Accountants of India (ICMAI) is a statutory body set up under an Act of Parliament in the year 1959. The Institute as a part of its obligation, regulates the profession of Cost and Management Accountancy, enrols students for its courses, provides coaching facilities to the students, organizes professional development programmes for the members and undertakes research programmes in the field of Cost and Management Accountancy. The Institute pursues the vision of cost competitiveness, cost management, efficient use of resources and structured approach to cost accounting as the key drivers of the profession. In today's world, the profession of conventional accounting and auditing has taken a back seat and cost and management accountants increasingly contributing towards the management of scarce resources like funds, land and apply strategic decisions. This has opened up further scope and tremendous opportunities for cost accountants in India and abroad.

International Affiliation

The Institute is a founder member of International Federation of Accountants (IFAC), Confederation of Asian and Pacific Accountants (CAPA) and South Asian Federation of Accountants (SAFA). The Institute is also an Associate Member of ASEAN Federation of Accountants (AFA) and member in the Council of International Integrated Reporting Council (IIRC), UK.

Institute's Network

Institute's headquarters is situated at Kolkata with another office at New Delhi. The Institute operates through four Regional Councils at Kolkata, Chennai, Delhi and Mumbai as well as through 117 Chapters situated in India, 11 Overseas Centres abroad, 2 Centres of Excellence, 61 CMA Support Centres and 401 Recognized Oral Coaching Centres.

Institute's Strength

The Institute is the largest Cost & Management Accounting body in the World, having a large base of about 1,00,000 CMAs either in practice or in employment and around 5,00,000 students pursuing the CMA Course.

Vision Statement

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

Mission Statement

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

Course Objective

- To build strategies and effectively integrate sustainability matters into all business practices dealing with the strategy, finance, operations and communications.
- To comprehend and assimilate the rules and regulations and structural framework of Business Responsibility and Sustainability Reporting.
- To understand and analyze the various disclosures made by the Indian companies and various assurance aspects.
- To understand and comprehend the best practices adopted in ESG.
- To build an understanding for preparation of Business Responsibility and Sustainability Report.
- To understand the value chain partners and their role in the business proposition.
- To properly map Business Responsibility and Sustainability Report to Global Reporting Initiative (GRI) and Integrated Reporting Framework.

Course Eligibility

- FCMA/ACMA/ those who have qualified Final CMA examination
- Final year Students of the CMA course
- Any Graduate

(Minimum Intake is 25 numbers to start a batch)

Course Duration

- Classroom learning of 2 hours per day in the Weekend through online mode
- 50 hours online coaching

Online Examination for 100 marks

- Multiple Choice Questions – 60 questions, 1 mark each
- Case Study (also multiple choice)– 10 questions, 2 marks each
- Project Report – online submission – 20 marks ((including project presentation through video mode - 10 marks for a duration for 5 minutes)

Minimum Marks is 60% in each of the all above levels

Course Fees

- Course Fees (including learning kit) of Rs. 6000 plus GST of 18 %.
- Final year Students of the CMA course for an amount of Rs. 4500 plus GST of 18 %.
- Examination Fees of Rs. 750 plus GST per attempt.

Syllabus of the ESG Course

Session No.	Particulars	Module Duration
1	**Shareholders to stakeholders** Shifting emphasis from shareholders to Stakeholders The Three Ps – People, Planet and Profits Connecting sustainability to Strategy and Corporate Governance **ESG – the pathway to Sustainability** Introduction Conceptual framework Material ESG Issues Concept of ESG Maturity Challenges in implementing ESG	4 hours
2	**Importance of Economics, Environment, Social and Governance (E+ESG) in Sustainability** **UN Mandated Sustainable Development goals (SDGs)** 17 SDGs SDG performance- Global and Indian Context Reconciling priorities of SDGs Global and Indian Context	4 hours
3	**Issues with respect to Environmental Factors** **Conference of Parties (COP) – Key Takeaways from Recent Editions** Climate Change – Risk Mitigation and Adaptation Challenges arising out of depletion of natural resources, bio-diversity loss, land use and marine resources, Waste Disposal, Carbon Emission, Conservation of Energy	4 hours
4	**Product Life Cycle, Service Life Cycle and Life Cycle Assessment, circular economy and Environmental laws** Clean and technological innovation Green / ESG related products Blue Economy Approaches to Environmental Analysis – Differences in approaches of developing, emerging and developed economies	4 hours
5	**Overview of Framework relating to social security and Human rights** NHRC Training & Development New Labour Code Labour-Employer relationship Occupational Health & Safety Community Development & Public Policy POSH	4 hours
6	**ESG Investments, Different ESG Instruments, Ratings, Due Diligence and Assurance** **Approaches to ESG Investments** Responsible Investment, Socially Responsible Investment (SRI), Sustainable Investment, Best in Class Investment, Thematic Investment, Impact Investment, Green Investment etc. ESG Ratings – How conceptually different from Credit Ratings, Regulatory Ratings and Investor driven ratings ESG Rating Providers (ERP) and their Internal Audit ESG Assurance – External Assurance and Internal Audit / Assurance ESG Due Diligence ESG considerations in Valuation ESG Risk & Opportunities	6 hours

Syllabus of the ESG Course

Session No.	Particulars	Module Duration
7	**Role of Metrics and Targets in ESG Reporting– How ESG compliance creates long-term value for the organization?** • KPIs in the BRSR Core • Other Regulatory Prescriptions – IRDAI, RBI. • Analysis of Corporate Filings	6 hours
8	**Sustainability and Capital markets** • Evolution of regulations: NGRBC and BRSR • Social Stock Exchange • Sovereign Green Bonds • Green Deposits • Green Debt Securities and ESG Debt Securities • ESG Schemes of Mutual Funds • National green/climate finance taxonomy • Overview of global and domestic sustainable finance markets **Overview of global reporting framework** • GRI • IIRC • TCFD • CSRD • EFRAG • ESRS • IFRS Sustainability Standards • ISS1 and ISS2	6 hours
9	**Detailed coverage of BRSR** 3 sections 9 principles Essential Indicators and Leadership Indicators Presentation / coverage on the detailed requirements of disclosure in the reporting Guidance Note Issued by SEBI Identification of data points in the BRSR report and discussion on the same. Case studies and practical aspects with respect to BRSR	4 hours
10	**Concept of ESG Audit and opportunities**	2 hours
11	**Project Work**	6 hours
	Total	50 hours

Contact for further queries

Course Coordinators

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Sustainability Standards Board

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THE INSTITUTE OF COST ACCOUNTANTS OF INDIA
Statutory Body under an Act of Parliament
www.icmai.in

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Behind every successful business decision, there is always a CMA

Emergence of Solar Power in Indian Roads

CMA (Dr.) Aditi Dasgupta
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As the global climate crisis accelerates, India is intensifying its efforts to transition toward renewable energy. With abundant sunlight for most of the year and a growing demand for clean power, solar energy has emerged as a cornerstone of the country's energy strategy. While solar panels on rooftops and solar farms in deserts have become increasingly common, a new frontier is now coming into focus: India's roads. From national highways to rural roads, the country's vast transportation network is being reimagined as a canvas for solar infrastructure. This concept—of using roadways not just for mobility but also as energy generators—presents a novel opportunity to integrate sustainability into everyday infrastructure.

Over the past decade, India has made remarkable strides in expanding its solar power capacity, with ambitious plans to integrate this clean energy source into its transportation infrastructure. Union Minister has announced the government's commitment to developing solar-powered highways, enabling electric buses and heavy-duty trucks to charge while in transit. Complementing this initiative is the planned deployment of an Intelligent Traffic System (ITS) across 15,000 km of national highways by the end of 2024, aimed at enhancing road safety and efficiency.

One of the early milestones in this transition is the Kundli-Ghaziabad-Palwal (KGP) Expressway—the country's first solar-powered expressway. Several greenfield expressways are also in the pipeline, underscoring India's commitment to sustainable infrastructure. Such advancements not only support environmental goals but also stimulate employment, economic growth, and business development.

India is increasingly embracing advanced technologies in its highway network, including the implementation of electric roads (E-roads) and expressways. These are designed to power a significant volume of electric vehicles (EVs) through dynamic, on-the-move charging. NITI Aayog projects that by 2030, EVs will constitute 80% of two- and three-wheelers, 40% of buses, and between 30% to 70% of cars in the country.

Why Solar Roads?

- Over **6.3 million km** of roadways across India
- **300+ sunny days** in many regions
- Roads offer **dual-use space**—no land acquisition needed

E-roads allow real-time energy transfer between vehicles—especially commercial ones like trucks and buses—and the road surface. To support this shift, the National Highways Authority of India is focused on building widespread EV charging infrastructure along highways and expressways. This move is expected to reduce dependence on fossil fuels and significantly cut carbon emissions. At present, electrification efforts are being concentrated on heavy-duty vehicles via the construction of E-roads.

On average, one kilometer of E-road can accommodate around 1.2 MW of solar photovoltaic (PV) capacity. For large-scale deployment, it's crucial to assess the feasibility of combining E-roads with PV Noise Barriers (PVNBs). This process would involve identifying current and proposed expressways for electrification, determining energy requirements, and evaluating

the physical and geographical suitability—such as terrain orientation, road dimensions, and solar exposure. Following the technical analysis, cost-effectiveness and commercial viability must be thoroughly assessed.

Key Initiatives and Projects

1. *Green Expressways & Electric Highways*
   - Union Minister announced the development of 26 greenfield expressways powered by solar energy. These roads will also feature charging infrastructure for electric vehicles.
2. *Delhi-Dehradun Expressway*
   - Elevated sections of this expressway will be fitted with solar panels to power roadside amenities and simultaneously solve parking issues.
3. *Kundli-Ghaziabad-Palwal (KGP) Expressway*
   - India's first solar-powered expressway includes eight solar plants with a total capacity of 4 MW. These provide energy for underpass lighting, irrigation, and rainwater harvesting.
4. *250 MW Solar Plant on Mumbai-Nagpur Highway*
   - Maharashtra State Road Development Corporation (MSRDC) plans to develop a 250 MW solar facility along this 700 km highway, aimed at powering EV charging and other utilities.

Here's a small video on this. Just click below -

https://drive.google.com/file/d/1eNzp30yJMstE5OunNMuw86EA1p4lcFWT/view

Pilot projects across different states can offer valuable insights into the scalability of E-roads paired with PVNBs. With EV demand surging, this integrated approach could meet solar targets, create jobs, reduce pollution, and improve visual and infrastructural aesthetics. However, such initiatives require a well-articulated vision, strong policy backing, and a supportive regulatory framework.

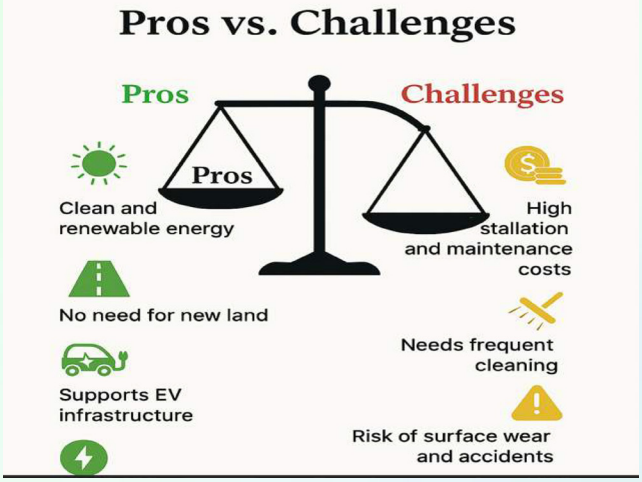
⚙ How They Work

Solar Tiles	**Embedded photovoltaic surfaces along roadsides that convert sunlight into electricity.**
Smart Grids	AI- and IoT-enabled systems that intelligently manage and distribute solar-generated power.
EV Charging	Solar-powered roadside stations that charge electric vehicles with clean, renewable energy.

■ Fun Fact

1 km of solar road can power up to 150 streetlights!

The concept of solar roads revolves around replacing traditional asphalt roads with structurally engineered, solar-integrated surfaces. These roads are built using tempered, heavy-duty glass embedded with photovoltaic cells, electrical wiring, and LED lighting. Such a design not only withstands the weight of heavy vehicles but also serves as an intelligent, decentralized power grid. These interconnected panels are capable of generating and distributing electricity, forming a vast energy network connecting highways, parking lots, rest areas, and even remote villages.



In areas with limited access to electricity, solar roads can provide a reliable and affordable energy source, simultaneously improving connectivity and boosting tourism. Additionally, they contribute to environmental conservation by reducing reliance on fossil fuels and cutting greenhouse gas emissions by nearly 50%.

While the initial cost of installing solar roads is roughly three times that of conventional asphalt roads, the long-term benefits—durability, modular design, self-sustaining energy generation, and reduced maintenance—make them a worthwhile investment. Studies suggest that even with 20% efficiency, a full-scale solar road infrastructure could generate up to three times the nation's current electricity consumption.

Beyond energy, solar roads bring added advantages: embedded smart grids, enhanced road safety via motion sensors and microprocessors, LED lighting, and integrated snowmelt systems. These multi-functional panels could revolutionize India's roadways, offering a sustainable model for future infrastructure.

Future Outlook

- Costs expected to drop **30–40% by 2030**
- Increasing number of **public-private partnerships**
- Supports India's **Net Zero by 2070** commitment

With targeted implementation on highways, fuel stations, and parking zones, India's solar roads could usher in a transformative era—turning passive road infrastructure into active contributors to the nation's power and mobility ecosystem. Every investment in this infrastructure brings cumulative returns, not only economically, but also through energy independence and climate resilience.

The promise of solar roads in India is too significant to overlook. With advancing technology and falling costs, these innovative systems could become integral to the country's sustainable infrastructure. Utilizing existing road space minimizes the need for additional land acquisition—a persistent challenge in India's development landscape. More than just energy generators, solar roads can spur employment across installation, maintenance, and engineering sectors. They also support India's international climate commitments, including its goal to reach net-zero emissions by 2070.

India's highways are evolving—from conduits of commerce to catalysts of clean energy. The integration of solar infrastructure marks a forward leap toward sustainability driven by innovation. Although obstacles remain, the foundations are in place. With continued investment, strong policy frameworks, and active public engagement, these roads could soon light the way—powered not just by headlights, but by the sun itself.

India's solar road initiatives reflect a bold move toward renewable energy adoption and smarter infrastructure. Pilot projects hint at meaningful environmental benefits, but long-term success will hinge on overcoming technical challenges, ensuring maintenance efficiency, and maintaining steady policy support.

Cost and Management Accountants (CMAs) can play a crucial role in the integration of solar power into Indian roads by ensuring financial sustainability and efficiency. They can assess the economic feasibility of projects through detailed cost-benefit analysis, life cycle costing, and ROI evaluation. CMAs can help in structuring effective budgeting and cost control systems during both installation and maintenance phases. By aligning projects with ESG goals and sustainability reporting standards, they support transparency and accountability. Moreover, CMAs can advise on public-private partnership models, track performance metrics, and guide policymakers with data-driven insights, ensuring solar road projects are both impactful and financially viable. SB

ARTICLE-I

Plastic Waste Management

Vijay Ghadge
Liaisoning Officer
Nirmal Vasundhara Pvt Ltd,
Gandhinagar

World Environment Day 2025 - "ONE NATION, ONE MISSION: END PLASTIC POLLUTION"

Today, as we celebrate "World Environment Day", let's renew our commitment to sustainability and responsible action. The Earth is our shared home, and it's our duty to protect it for future generations.

Plastic pollution continues to be one of the most urgent environmental challenges. Each year, millions of tons of plastic end up in oceans, harming marine life and ecosystems. It's time to take action:

- Reduce single-use plastics
- Opt for biodegradable alternatives
- Support recycling initiatives
- Educate and advocate for sustainable policies

Our Collective Responsibility

From global leaders to local communities, sustainability is a shared mission. Let's act today, innovate responsibly, and inspire change. Because when we protect nature, we protect life itself.

Join the Movement "Act for the Earth

#WorldEnvironmentDay2025 #ESG #Plastic Pollution # save Our Planet #Sustainable Future

Why focus on plastic pollution?

Globally over 460 million tons of plastic are generated every year. In India's plastic waste reality: we generate 4.13 million tons of plastic waste annually. Our cities generate an average of 11,000 tons per day of plastic waste. Limited recycling and mismanaged disposal are clogging landfills, chocking rivers and polluting the air – making plastic pollution an urgent call for action.

Ending global plastic pollution requires a multifaceted approach, including individual actions, policy changes and international collaboration. Plastic pollution is a global problem. Every year 19 to 23 million tons of plastic waste leak into aquatic ecosystem, polluting lakes, rivers and seas.

Accumulation in the environment of synthetic plastic products to the point that they create problems for wildlife and their habitats as well as for human being.

Ten harmful effects of plastic – health issues, eye irritation, vision problem, breathing difficulties, liver dysfunction, cancer, skin diseases, lung problems, headache, dizziness, birth defects, reproductive disorders, cardio vascular ailments, genotoxicity and toxicity to the digestive system.

Plastic pollution, particularly single use plastics, contributes to environment degradation, threatens wild life and release harmful chemicals into the ecosystem. Additionally, plastic production and waste management processes can be energy incentive and contribute to greenhouse gas emission leads to climate change. Further thin plastic which is not collected by rag pickers either remains in atmosphere leading to deterioration of aesthetic view, consumed by stray cattle leading to even death or burnt in open emitting toxic fumes.

Looking to above issues Government has devised circular economy based plastic EPR which fixes liability to generator and same can be offset by purchasing credits from recyclers which will lead to plastic neutrality.

Mission LiFE (From India for the world)

Lifestyle For Environment (LiFE) is India's global movement launched by PM Narendra Modi at COP 26.

- To inspire each one of us – individual's families and communities to make small life style changes that protect our planet.
- From refusing single use plastics to mindful consumption - LiFE is full of simple, doable actions we can all follow.

Small steps today - Big impact tomorrow

- Change start with you – choose steel or recycled too.
- Use steel/recyclable lunch boxes and water bottles.
- Join a cleanup drive in your city. Participate in beach, rivers and neighborhood clean-up drives.
- Mobilize your community to protect our lakes, rivers and oceans.
- Cut the packaging bags used for milk, buttermilk etc. only partially, to avoid plastic bits for mixing into biodegradable waste.
- Opt for bamboos tooth brushes and neem combs.
- Prefer only non-plastic ecofriendly cutlery during gatherings and events.
- Still using disposable sanitary napkins! Switch to menstrual cups – reusable, ecofriendly and better for your health.
- Stepping out! Have you checked these essentials! Don't forget your water bottle – stay hydrated and skip single use plastic.
- Use cloth/paper bags instead of plastic.
- Choose products with minimal or ecofriendly packaging. Support brands that prioritize sustainability.
- Buy in bulk, reuse and recycle properly. Learn your local recycling guidelines and follow them carefully.
- Compost organic waste. Reducing food and packaging waste lowers the demand for plastic use.
- Volunteer with local NGOs or environmental clubs.
- Help organize awareness walks, poster competitions or eco events in schools and societies.
- Support businesses that uses biodegradable packaging or run refill stations.
- Vote for leaders who prioritize climate action and plastic regulation.
- Sign petitions and write to policy makers urging for stronger plastic banes and producer responsibility laws.
- Share articles, videos and facts about plastic pollution on social media.
- Talk to your children about the importance of protecting nature.
- Host film screenings, quizzes or discussions about conservation of environment and abatement of plastic pollution.

Plastic pollution ends when action begins

- Refuse single use plastic
- Reuse bags/container which are reusable
- Reduce plastic waste
- End plastic pollution.

IT TAKES THIRTY YEARS TO GROW TREE, TWO MINUTS TO CUT IT DOWN AND A LIFE TIME TO FEEL THE LOSS. SAY NO TO SINGLE USE PLASTIC

SB

Vasudhaiva Kutumbakam

VK Webinar Series of the Sustainability Standards Board

33rd Webinar

Sustainability Practises in Corporates- The Middle East Perspective

May 30, 2025 from 4 to 5:15 p.m.

CMA (Dr.) Ashish P.Thatte

CMA Dibbendu Roy

CMA Dattatraya Ghadge

The Sustainability Standards Board (SSB) of the Institute of Cost Accountants of India (ICMAI) successfully organized an insightful webinar on *"Sustainability Practices in Corporates – The Middle East Perspective"* on May 30, 2025. The session featured CMA Dattatraya Ghadge, Financial Controller at Awal Gulf Manufacturing and Chairman of the Bahrain Overseas Centre of ICMAI, as the distinguished speaker.

CMA (Dr.) Ashish P.Thatte, Chairman, SSB provided the opening remarks and the initiatives undertaken by the SSB, ICMAI and requested all members for their active participation for all the endevours undertaken by the SSB, ICMAI.

CMA Ghadge elaborated on the current sustainability practices being adopted across the Gulf Cooperation Council (GCC) countries, underlining significant growth opportunities for professionals in the region. He focused on the evolving role of Cost and Management Accountants (CMAs) in sustainability reporting and accounting, sharing valuable insights from his practical experiences.

During his presentation, he outlined the key economic and environmental indicators shaping the sustainability landscape in GCC, the vital role of various stakeholders including Governments, Corporates, and MSMEs, Government initiatives such as the ESG regulatory framework, corporate governance reforms, energy efficiency measures, green building codes, nationalization policies, and solar energy programs and finally the noteworthy leadership examples and success stories from the region.

CMA Ghadge emphasized the importance of diversification strategies being implemented across GCC nations and discussed the associated challenges. He concluded with a strong message on the growing relevance of sustainability, the imperative for economic diversification, and the expanding scope for CMAs in the domain of sustainability accounting.

The webinar concluded with an interactive Q&A session, where participants raised pertinent queries, leading to meaningful discussions on career and capacity-building opportunities in the sustainability domain across the GCC.

CMA Dibbendu Roy, Secretary of the SSB, ICMAI, delivered the Vote of Thanks, expressing heartfelt appreciation to CMA Ghadge for his insightful address and to all attendees for their enthusiastic participation.

Vasudhaiva Kutumbakam

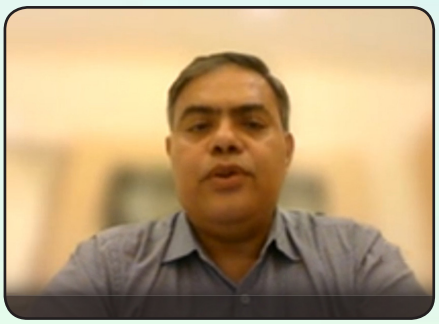
VK Webinar Series of the Sustainability Standards Board

34th Webinar

Bond and Equity Listing in the IFSC- The route to sustainable economic growth

June 13, 2025 from 4 to 5:15 p.m.

Shri Akash Boddeda (L) and Shri Saurabh Kumar (R)



CMA Dibbendu Roy

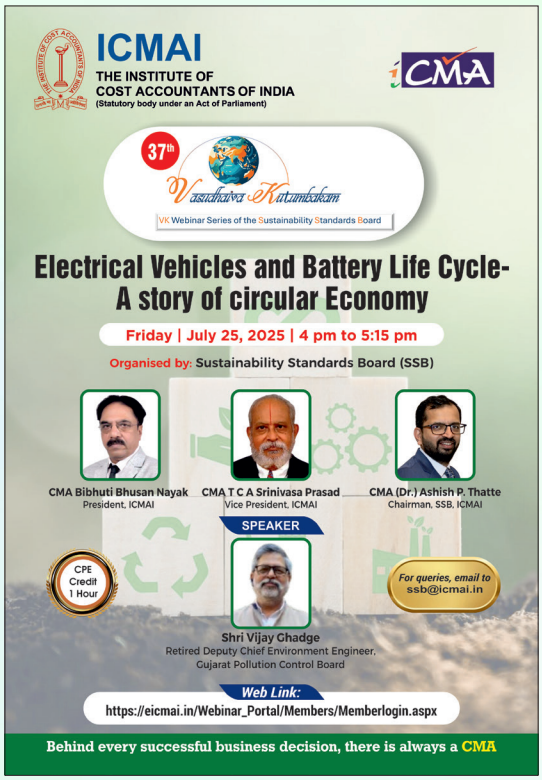
The Sustainability Standards Board (SSB) of the Institute of Cost Accountants of India (ICMAI) successfully conducted an insightful webinar on the theme "Bond and Equity Listing in the IFSC – The Route to Sustainable Economic Growth" on June 13, 2025.

The session featured two eminent speakers from the International Financial Services Centres Authority (IFSCA): Shri Saurabh Kumar, Manager, IFSCA, and Shri Akash Boddeda, Assistant Manager, IFSCA.

Shri Saurabh Kumar opened the session with a comprehensive overview of IFSCA, detailing its various verticals with a special focus on the capital markets segment. He elaborated on the concept and framework of GIFT City, India's first greenfield smart city and a globally benchmarked financial services centre. He provided a jurisdictional comparison between IFSC GIFT City, foreign financial centres, and the domestic tariff area, underscoring GIFT City's unique regulatory and infrastructural advantages. He also showcased the evolving financial ecosystem at IFSCA, highlighting the participation of multiple entities in the BFSI sector and the performance highlights of the centre. Shri Akash Boddeda delivered an informative presentation on equity and bond listing frameworks within IFSCA. He outlined the background and structure of direct listings, including the provisions for foreign companies to list in IFSCA. His presentation included a detailed checklist of listing requirements, compliance obligations, and a snapshot of the regulatory framework. Further, Shri Saurabh Kumar provided a deep dive into debt listing procedures, with a special emphasis on ESG-labelled bonds, associated disclosures, and the role of independent external reviewers in ensuring transparency and accountability in sustainable finance instruments. Shri Akash Boddeda also highlighted the regulatory features governing the listing of commercial papers and certificates of deposit, expanding on the breadth of financial instruments supported within the IFSCA framework. The session concluded with a vibrant Q&A segment, where participants engaged in thoughtful discussions, raising queries related to the various aspects of IFSCA and the listing aspects covering both the equity and bonds.

CMA Dibbendu Roy, Secretary, Sustainability Standards Board, ICMAI, delivered the Vote of Thanks, extending heartfelt appreciation to the speakers for their insightful address and to all attendees for their active and enthusiastic participation.

FORTHCOMING VASUDHAIVA KUTUMBAKAM SERIES



CPE Credit 1 Hour

Web Link:
https://eicmai.in/Webinar_Portal/Members/Memberlogin.aspx

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iCMA

Webinar Series on

GLOBAL SUSTAINABILITY OPPORTUNITIES– GULF PERSPECTIVE

Sustainability Standards Board and the International Affairs Committee of ICMAI are jointly coming out with an International Webinar Series titled – **"Parinayati"**

To start with, we are coming out with a series covering the Gulf region over 4 sessions of one hour each.

The coverage is as follows: -

Day 01 Tuesday, July 1: 5PM to 6.15 PM

- Understanding the Gulf business environment and framework segment-wise business avenues
- Need & Scope for Sustainability

Day 02 Wednesday, July 2: 5PM to 6.15 PM

- Is Climate Change & global warming issues ringing alarm bells in the Gulf?
- SDG – parameterwise / country-wise performance

Day 03 Wednesday, July 16: 5 PM to 6.15 PM

- Overview of Regulatory framework of Sustainability
- Role of professionals in implementing sustainable practices
- Relevance of ISS1 and ISS2

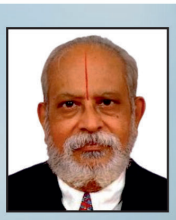
Day 04 Thursday, July 17: 5 PM to 6.15 PM

- Key Lessons from BRSR for the Gulf
- ESG Assurance

For queries, email to ssb@icmai.in

CPE Credit 4 Hour

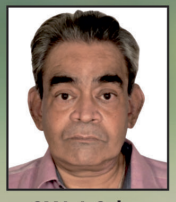
CMA Bibhuti Bhusan Nayak
President, ICMAI



CMA T C A Srinivasa Prasad
Vice President, ICMAI

CMA (Dr.) Ashish P. Thatte
Chairman
Sustainability Standards Board & International Affairs Committee, ICMAI

Resource Persons



CMA A.Sekar
Practising Company Secretary

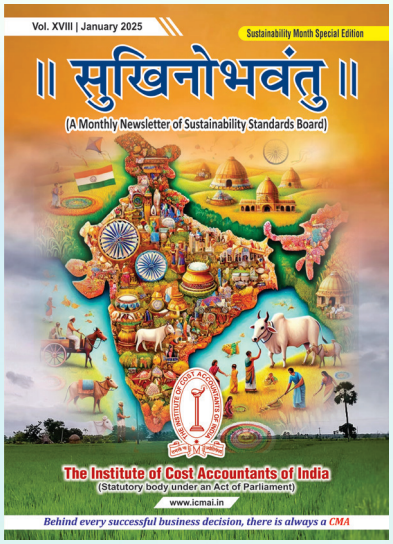
Dr. Ranjith Krishnan
Sustainability Consultant

Web Link: https://eicmai.in/Webinar_Portal/Members/Memberlogin.aspx

Organised by: Sustainability Standards Board and International Affairs Committee

Behind every successful business decision, there is always a CMA

Past Issues of *Sukhinobhavantu*



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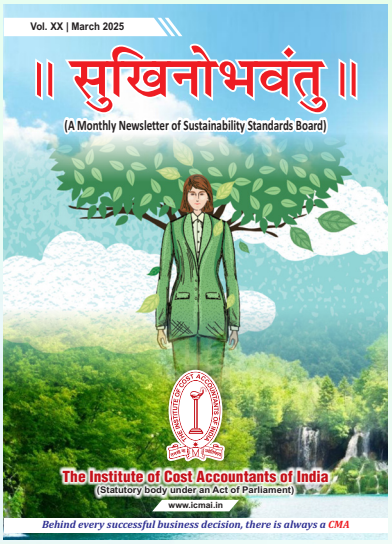

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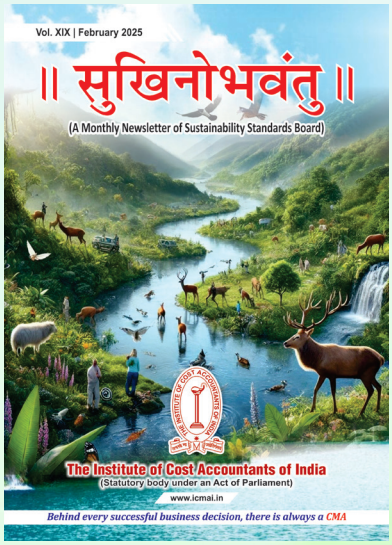

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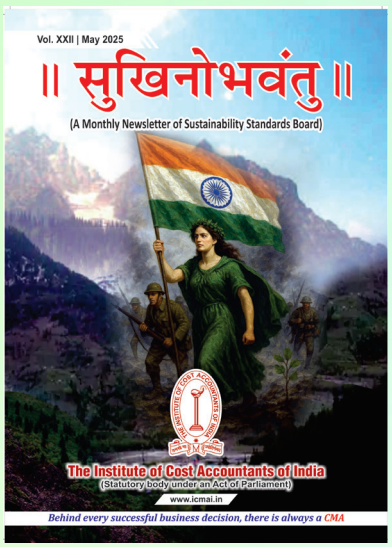

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Traditional Water Management Systems: Lessons for Modern Sustainability

Usha Ganapathy Subramanian
Practicing Company Secretary
Chennai

1. Introduction

Samuel Taylor Coleridge wrote, "Water, water everywhere, nor any drop to drink" in the Rime of the Ancient Mariner in 1798. Maybe he knew that his words would ring true even a couple of centuries later! Water is the essence of life, yet water scarcity is a growing global concern. India too, despite its many rivers and diverse geographies, faces acute water stress in many regions. Today's water management often relies heavily on large-scale infrastructure like dams, canals, or piped networks that may not always suit every community or topography. As sustainability takes the centre stage global development, revisiting traditional water management systems may offer valuable insights.

Across centuries, Indian communities had developed various types of indigenous and ingenious water conservation techniques, most of which were decentralized in nature. The decentralized nature meant that the water conservations systems were perfectly adapted to local climates, geographies, and cultures. Traditional stepwells, tanks, and rainwater harvesting provided resilience against seasonal changes, by supporting agriculture, and ensuring drinking water security. Being places of utility to entire neighbourhoods or villages, they also fostered communal harmony.

Today, these ancient practices hold the potential to enrich modern sustainability frameworks. Let us explore these systems and their enduring relevance.

2. The Wisdom of Ancient Water Systems

a. Stepwells (*Baolis/Baoris/Vavs/Pushkaranis*)

Stepwells are not just architectural marvels, they were functional, offering solutions to water shortages. Stepwells refers to deep wells with descending flights of steps leading to a body of water. They were popular across arid and semi-arid regions such as Gujarat, Rajasthan, and Northern Karnataka.

The water in the stepwells is located so deep that the they are not susceptible as much to loss due to evaporation. While even rivers and creeks dry up, the lower exposure to sun in the stepwells insulated them.

Stepwells were usually set up as a part of the temple's premises or around temples, or on the outskirts of villages. Hence, they doubled up as cultural hubs. They were also ornate and artistic, inspiring the imagination of the society.[1]

These stepwells have stood the test of time; stepwells like *Agrasen ki Baoli* in New Delhi, *Rani ki Vav* in Patan, Gujarat (UNESCO World Heritage Site), and so on, have doubled up as places of tourist interest.

Stepwells embodied a circular, community-driven effort.

b. Temple Tanks and Village Tanks

Across India, temple tanks and village tanks (*kulams*, *kunds*, *cheruvus*, *kere*) were integral to water management. These were

1 https://en.wikipedia.org/wiki/Stepwell

large open reservoirs connected to local catchments. They were used for drinking water needs, for bathing, for cleaning cattle, irrigation and even for aquaculture. They have been places of community and religious festivities for centuries. Tanks also served as biodiversity spots and played a role in ecological conservation.

c. Rainwater Harvesting

Be it the cisterns of Harappan cities[2], or tankaas in the homes of Rajasthan[3], or the Chettinad houses of Tamil Nadu with rainwater harvesting mechanisms, rainwater harvesting is a water conservation method practised since antiquity that has great relevance today. This can be seen from the Government schemes pushing for rainwater harvesting. This system of decentralised grassroot level water conservation system mitigated the need to rely on centralized supplies. They also replenished local aquifers.

3. Benefits of Traditional Systems

a. Decentralization and Community Ownership

Modern piped water networks tend to be corporatized or government-owned, in other words, represent top-down and resource-intensive frameworks. Whereas, the decentralized nature of the traditional systems fostered local stewardship of water resources. A sense of collective ownership and responsibility prevailed. This model can be harnessed even in today's world.

b. Climate Adaptation

Climate change increases rainfall variability and extreme weather events. Traditional water systems are inherently low-carbon, are adaptive and flexible to the varying local climatic conditions. This makes them inherently sustainable.

c. Ecological Benefits

Since the traditional water conservation mechanisms were aligned with nature, they also supported biodiversity and micro-habitats. Their revival can enable implementation of ecosystem-based approaches to water management by enhancing groundwater recharge, which in turn improves soil moisture and local climate, which in turn supports flora and fauna.

2 https://en.wikipedia.org/wiki/Harappan_architecture
3 https://www.rridma.org/images/story/file_54872016.pdf

d. Cultural Continuity and Social Cohesion

Revival of decentralized water systems can revive intergenerational knowledge transfer and renew the sense of pride in local customs and traditions. Community rituals that reinforce respect for nature could get a new lease of life. Traditional ecological wisdom can continue to guide our posterity.

4. The Need to Integrate the Past Wisdom with Modern Efforts

Traditional water conservation systems have fallen into disuse due to popularity of centralized water governance models, encroachment by commercial interests, lower quality of water due to increasing pollution levels, lack of technical know-how for restoration efforts. Beyond these, an artificial barrier **to revival that looms large is the institutional fragmentation as different departments handle irrigation, drinking water, and art and heritage.**

- Policy Measures: Programmes like *Jal Shakti Abhiyan*, Mission *Amrit Sarovar* can help create large-scale awareness and commitment to water conservation and community self-sustenance and participation. Cross-departmental task forces may be assigned to achieve deeper integration of the past wisdom with modern infrastructure.
- Urban Planning: Cities such as Chennai and Bengaluru are enforcing rainwater harvesting mandates. Urban planning must focus on restoring urban tanks, updating building codes, and involving citizens in water body management. Combining traditional systems with modern technology and planning builds climate-resilient, decentralized water security.
- Leveraging Technology: Technologies like GIS (geographic information system), sensors, and digital platforms enhance tank monitoring, and climate-preparedness.

5. Conclusion

Achievement of the Goal 6 of the United Nations' Sustainable Development Goals – "Ensure availability and sustainable management of water and sanitation for all" will require not just capital-intensive large-scale efforts by corporates and the government, but also water conservations efforts at the grassroots. This is where the wisdom of the past can help bridge the gap. Reviving traditional water systems offers a low-cost, ecologically sound, and socially empowering alternative to address today's water crises. SB

FEATURE

Sustainability Measures in Indian Insurance Companies: An ESG Perspective

CMA Dibbendu Roy
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Kolkata

In the present scenario, both life and general insurance companies in India are actively embracing sustainability practices by integrating Environmental, Social, and Governance (ESG) factors into their operations, investment strategies, and governance frameworks.

Public Sector Leaders in ESG Integration

Life Insurance Corporation of India (LIC)

LIC remains the predominant player in the life insurance space. It is increasingly aligning with national and international sustainability standards as part of its ESG policy. LIC integrates ESG factors in its investment strategies and operations to ensure long-term value creation and responsible governance.

National Insurance Company Limited (NICL)

A pioneer among public sector general insurers, NICL is making notable strides in ESG adoption:

- Governance: Promotes gender diversity by including women on its Board.
- Social: Maintains a workforce with over 31% female employees and promotes sustainable commuting practices such as the use of electric vehicles.
- Environmental: Incorporates ESG risks into underwriting and investments while encouraging its portfolio companies to adopt sustainable practices.
- Disclosure: NICL is enhancing its ESG reporting, particularly in diversity and workforce inclusion metrics.

Social Insurance and Inclusion: Government Schemes

Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)

- A one-year renewable life insurance scheme for individuals aged 18–50.
- Offers ₹2 lakh death benefit for an annual premium of ₹436.
- Auto-debited from bank/post office accounts and administered by participating insurers.

Pradhan Mantri Suraksha Bima Yojana (PMSBY)

- An accidental insurance scheme for individuals aged 18–70.
- Covers accidental death and disability with a ₹2 lakh benefit.
- Annual premium of only ₹20, renewed yearly.

IRDAI's Bima Trinity: Revolutionizing Insurance Access

The Bima Trinity initiative by IRDAI is a flagship effort to achieve "Insurance for All by 2047." It comprises:

1. Bima Sugam: A digital platform for buying, managing, and claiming insurance—serving as a unified insurance marketplace.
2. Bima Vahak: A women-centric, community-based sales force designed to increase awareness and penetration, particularly in rural areas.
3. Bima Vistaar: A bundled policy offering multi-risk coverage (life, accident, property,

and health) designed for affordability and last-mile accessibility.

ESG-Driven Innovations in the Insurance Sector

Digital Transformation

- Insurers like HDFC Life and ICICI Prudential have adopted digital policy platforms.
- E-policy issuance, claim settlement, and onboarding processes have been streamlined, reducing paper usage and promoting green operations.

Green Infrastructure

- Companies like **SBI Life** have invested in energy-efficient, green-certified buildings to reduce their carbon footprint.

Green Investments

- Investment portfolios are increasingly ESG-compliant with a focus on:
  - Green bonds
  - Renewable energy projects
  - ESG mutual funds

Responsible Governance

- Formation of ESG Committees at the Board level.
- Adherence to Global Reporting Initiative (GRI) standards and IRDAI's Stewardship Code.

Sustainable Underwriting and Risk Assessment

- Climate risk integrated into actuarial models.
- Exclusion of high-carbon industries from life and health underwriting.
- Cyber risk and pandemic preparedness are embedded into enterprise risk management frameworks.

Sustainable Product Innovations

- Health and life insurance products now include wellness incentives (e.g., wearable tech integration for fitness tracking).
- Parametric insurance for climate-triggered events (e.g., rainfall-indexed insurance for farmers).
- Climate-linked general insurance covering floods, droughts, and extreme weather conditions.

ESG Reporting and Disclosures

- Insurers such as HDFC Life, SBI Life, ICICI Lombard, and Max Life now publish dedicated sustainability reports.
- Disclosures include:
  - Carbon emission metrics
  - Diversity and inclusion data
  - Ethical investment policies

Emerging ESG Trends in Insurance

- Sustainable reinsurance partnerships
- Green claims processing
- Regulatory push for ESG integration and alignment with Sustainable Development Goals (SDGs)

Conclusion

Indian insurance companies—both public and private—are taking significant strides to embed ESG principles in their operational DNA. These measures not only reflect regulatory compliance but also demonstrate a proactive commitment to sustainable development, inclusion, and responsible governance. The alignment with ESG is no longer optional but a strategic necessity, paving the way toward a resilient, inclusive, and sustainable insurance ecosystem in India. SB

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Dining and Business Meal Etiquette

Usha Ganapathy Subramanian
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Introduction

A lot of business happens over conversations. And a lot of conversations happen over coffees and lunches. Untangling the professional etiquettes and expectations with respect to business lunches is all about bringing grace and professionalism to the table, quite literally.

Business meals offer an opportunity to foster trust, build relationships and understand the people in our workplaces and business settings deeper. How one conducts himself during such occasions can strengthen one's professional image. There is a flip side that it may sometimes cause unintended discomfort to the others. A well-mannered and graceful presence at the table reflects respect for the environment, cultural awareness, and social intelligence.

This article explores the various aspects of navigating business meals and dining etiquette with confidence.

Understanding the Purpose of Business Meals

Whether it comes to personal life or business, meaning and value are built on relationships. Having food is one of the basic things that connects every human being. Hence, food often forms a platform for bonding and building trust. Meals provide a relaxed atmosphere for building rapport.

One must read the cues to understand whether the meeting is for discussion or for simply building camaraderie. In the second case, one may just focus on finding common ground, talking about mutually-beneficial topics and building relationships. And this does involve a lot of active listening and empathy.

Some cultures or companies use meals as a venue for delicate negotiation or consensus-building. If business is to be discussed, it is usually after the first course or once rapport is established.

Cultural considerations

In some cultures, like that of Japan or France, building relationship through meals or beverages is almost a pre-requisite to doing business. In other cultures, it may be more transactional. In certain cultures, this may be unwarranted. One must study the context and the culture well before inviting someone over for a business lunch or dinner.

Navigating Table Settings and Utensil Use

One may do well to understand the generic place settings like placing forks on the left, knives and spoons on the right. The usage must generally start with the utensils farthest from the plate and work inward with each course. Usually, the bread plate is to one's left and the water glass is to the right. Placing napkin on one's lap as soon as one is seated is considered good etiquette. It may be used to dab one's mouth lightly but not to wipe one's face or clean the utensils. How one places the napkin also can be a gentle indicator of whether one has left the table mid-meal and would come back again or has finished his meal. If one is leaving the table mid-meal, the napkin would be placed on one's chair. After the meal, it may be folded loosely and placed to the left of the plate. The usage of cutlery could vary from region to region. In Europe, the fork stays in the left hand, the knife in the right. In other places, the fork may switch from left to right after cutting. In India, eating with hands is usually acceptable in most places for dishes like *dosas* and *rotis.*

These are just some of the things to be considered. There are detailed guidelines on which spoons, glasses and plates to use for which course, using placement of spoons as indicators, the combination of foods to be had, the way to

consume different types of food, and the list could go on. It would certainly be helpful to read up on the place, cuisine and the culture before one ventures in for the business meal.

Conversational Norms at Business Meals

Appropriate topics over business meals would be light conversations about hobbies, travel, food, culture, non-controversial current events, and professional experiences. It is generally safe to ask about the other person's work, but care should be taken that it is not used as a pretext to monopolize the conversation with one's own achievements. Developing genuine interest in others' experiences does well here; of course, one should be aware of and respect the other person's boundaries. Generally, subjects like politics, religion, salary, controversial news topics and gossip must be avoided. It is not generally considered dignified to complain about the food or the restaurant.

Efforts should be made to engage actively with everyone at the table, and to avoid conversations with a select few that exclude others. Maintaining good eye contact is important. And certainly, putting the phone away is considered respectful in any business meal.

Handling Awkward Moments Gracefully

If there is an accidental spill, it is generally enough to apologise briefly, try to cleanup whatever is possible with whatever is available, or let the restaurant staff handle the cleanup. It is best not to make a big deal out of it. Being discreet about it is appreciated. If someone else spills, not making a big fuss and assisting calmly with the cleanup is graceful. If one arrives late, it is best to apologise briefly and join the meal without interrupting the ongoing conversations. If one notices someone else arriving late, acknowledging them politely and moving on with the ongoing conversation is generally considered acceptable.

Dietary restrictions

The host must generally consider the dietary preferences and restrictions ahead of time and select a venue that provides options for those under dietary restrictions. If one is a guest with dietary restrictions, they may discreetly inform the host or the server about restrictions when ordering without making it the central point of the conversation. It is perfectly acceptable to decline an item of food or beverage. Declining without lengthy explanations but politely is often the way to go about it.

Paying, Tipping, and Splitting the Bill

The host, that is, the one who invites the other party, is expected to pay, In conversations with clients, this especially holds good. Typically, the host, who is the service provider or vendor, pays, unless the client insists. In some professional contexts like team lunches, splitting the bill is becoming more common, but this must be discussed beforehand. If one is a host, signalling the server in advance and providing the card early is advisable, so the payment process is smooth and discreet. In some countries tipping is expected; like the US where 15 – 20% is usually the norm. In such cases, it must be ensured that the tip is adequate and consistent with professional standards. In countries where tipping is not customary or is included in the bill, tipping unnecessarily must be avoided. When in doubt, one may do well to do an internet search beforehand about the practices in the locality or ask locals or discreetly observe the general practice in the restaurant.

Conclusion

While every culture has its own rules on dining, what matters the most is being present, engaging thoughtfully, handling situations gracefully, and aligning one's behaviour with the expectations of the occasion. Good dining etiquette demonstrates respect for the host and fellow diners, and appreciation of the occasion. Business meals present an opportunity not just to close deals but to build lasting relationships.

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

Environmental Sustainability in Ancient Arab

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In today's world, "sustainability" has become a defining concept—symbolizing eco-conscious living and responsible resource use. Yet, the roots of sustainable practices trace back centuries, deeply embedded in ancient traditions, particularly those of the Arab world. Long before the term entered global discourse, Arab civilizations devised innovative ways to thrive in some of the planet's harshest environments. Their practices in architecture, agriculture, water management, and trade offer enduring lessons for our modern age grappling with climate change and ecological stress.

Arab architecture demonstrates a sophisticated understanding of environmental harmony and climatic adaptation. Structures such as the Alhambra in Spain and the Great Mosque of Djenne in Mali exemplify both aesthetic brilliance and a commitment to sustainable design. Builders used locally sourced materials like adobe, palm wood, and stone to construct homes that naturally regulated temperature—providing cool interiors during scorching days and warmth at night. They engineered ingenious passive ventilation systems, including wind towers, or barjeel, and central courtyards, to facilitate natural airflow and minimize the need for artificial cooling. These architectural principles, refined through generations, remain relevant today as sustainable design models.

Water has always been a vital yet scarce resource across much of the Arab world. In response, ancient engineers developed highly efficient systems for capturing, storing, and distributing water. The qanat system, composed of underground channels, transported water from distant sources while shielding it from evaporation and contamination. In Oman, the falaj system carried spring water over long distances to irrigate farms and supply settlements. These hydraulic systems reflected a deep respect for water conservation and community resource sharing, showcasing how engineering solutions were deeply integrated with sustainability principles.

The agricultural practices of ancient Arabs also reflect a profound understanding of ecology. They implemented qanat-based irrigation techniques to minimize water loss while ensuring consistent hydration for crops. Their farming methods included bio intensive cultivation, which emphasized high-yield, nutrient-dense crops grown in compact spaces—reducing land usage and maximizing productivity. They are credited with pioneering drip irrigation, which delivered water directly to plant roots with minimal waste. In areas of low rainfall, farmers mastered dryland techniques like ridge planting and contour farming, which conserved moisture and prevented runoff. The cultivation of date palms, a resilient and multi-purpose crop, further highlights the efficiency of their farming systems, as these trees provided not only nutrition but also building materials and fibre.

Arab contributions to sustainability extended beyond farming and construction into the realm of trade and knowledge exchange. Traders operating across vast networks were not merely purveyors of goods but also transmitters of agricultural innovations, irrigation technologies, and crop varieties. This exchange of ideas encouraged

biodiversity and the spread of adaptive farming techniques. Ethical trade was a cornerstone of Arab commerce, with an emphasis on resource stewardship and long-term environmental care. Responsible harvesting and sustainable practices ensured that resources were not depleted and ecosystems remained resilient.

The legacy of ancient Arab civilizations serves as a powerful reminder that sustainability is not just a modern ambition but a historical necessity. Through thoughtful architecture, sophisticated water management, environmentally sound agriculture, and conscientious trade, these societies exemplified how human innovation can flourish in balance with nature. Their enduring wisdom reminds us that sustainable living is not a trend but a principle—one rooted in history and crucial for the future. SB

Sustainability and ESG are discussed widely—from awareness and regulations to financial impact and climate change—yet much remains to know and understand through monthly Newsletter *Shukhinobhavantu*.

However, true sustainability requires a mindset shift driven by science and innovation—not only limited to discussions of conventional developments or analyses of the past.

Form this month issue we have started a series on breakthrough scientific developments that can bring real impact to the sustainability narrative.

Let us go beyond rhetoric and inspire change through science—under a new column titled –

"Voices of Science: Real Ideas for Real Sustainability."

"Innovations in sustainability does not just reduce harm—it redefines possibility"

As Insight Series - focus on meaningful scientific insights on sustainability: -

HYDROGEN: From a Weapon of Destruction to the Renewable Fuel of the Future

Insight Series: I

CMA Arunabha Saha
Practicing Cost Accountant
Thane

Hydrogen (H_2), the most abundant element in the universe, is emerging as a critical solution in the global shift toward sustainable energy. Once associated with destructive power, hydrogen is now a clean fuel driving decarbonisation and energy security. This article explores hydrogen's fundamental properties, production methods, applications, and challenges. The versatility of hydrogen spans from fuel cells, artificial Sun and power storage to industrial applications and transportation. Various production methods—grey, blue, green, and turquoise—determine its environmental impact. While challenges such as storage, transportation, and cost remain, ongoing advancements in hydrogen technologies are rapidly accelerating its adoption. With the global push for net-zero emissions, hydrogen is poised to transform energy systems, offering a path toward a cleaner and more resilient future.

"Hydrogen is the simplest element yet holds the key to solving the world's most complex energy challenges."

Introduction and Fundamental Properties:

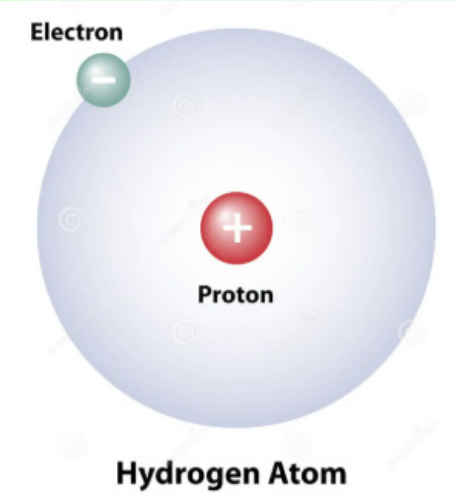
Hydrogen (H_2) is the lightest and most abundant element in the universe. Once feared as a component of devastating hydrogen bombs, it is now emerging as a key player in the transition to renewable and sustainable energy. This duality—its ability to both destroy and sustain—makes hydrogen one of the most fascinating elements in the energy landscape.

Here are words formed from HYDROGEN, each linked to a relevant hydrogen-related concept:

- H – Heat (Hydrogen combustion produces clean heat energy)
- Y – Yield (High energy yield from hydrogen fuel cells)
- D – Decarbonisation (Hydrogen helps reduce carbon emissions)
- R – Renewable (Green hydrogen is produced using renewable energy)
- O – Oxidation (Hydrogen undergoes oxidation in fuel cells to generate electricity)
- G – Gas (Hydrogen is a light, highly flammable gas used as an energy source)
- E – Energy (Hydrogen is a clean and sustainable energy carrier)
- N – Net-Zero (Hydrogen supports global net-zero emission goals)

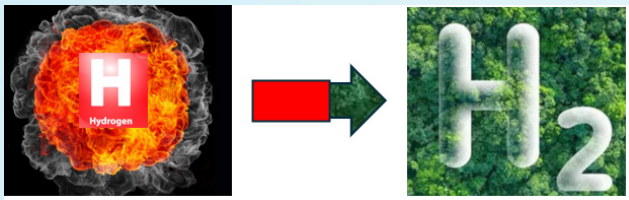
Key Properties of Hydrogen (H_2):

- Atomic Number: 1
- Molecular Formula: H_2
- State at Room Temperature: Gas
- Colour & Odor: Colourless, odourless
- Density: ~0.08988 g/L (much lighter than air)
- Flammability: Highly flammable, burns with an almost invisible blue flame



From Explosions to Controlled Energy:

Hydrogen's explosive nature made it a key component in the hydrogen bomb, the most powerful nuclear weapon ever developed. However, this same property is now being harnessed for controlled energy production through fuel cells and combustion processes.



"What was once designed to destroy the world as a hydrogen bomb is now being harnessed to save it"

Risks and Challenges:

- Flammability: Hydrogen ignites easily and burns with an almost invisible flame, making it a safety hazard.
- Storage & Transportation: Due to its low density, hydrogen requires advanced storage solutions such as high-pressure tanks or cryogenic liquefaction.
- Leakage: Hydrogen molecules are small and can seep through traditional containment materials, necessitating specialised infrastructure.

Production of Hydrogen:

Hydrogen can be produced through various methods, each with different environmental impacts:

1. Steam Methane Reforming (SMR): The most common method, producing hydrogen from natural gas but releasing CO_2.
2. Electrolysis of Water: Splitting water (H_2O) into hydrogen and oxygen using electricity. When powered by renewables, this process produces "green hydrogen."
3. Gasification of Coal or Biomass: Converts solid fuels into hydrogen-rich gases.
4. Thermochemical & Photochemical Processes: Experimental methods using heat or light to split water.

Types of Hydrogen Based on Production Methods:

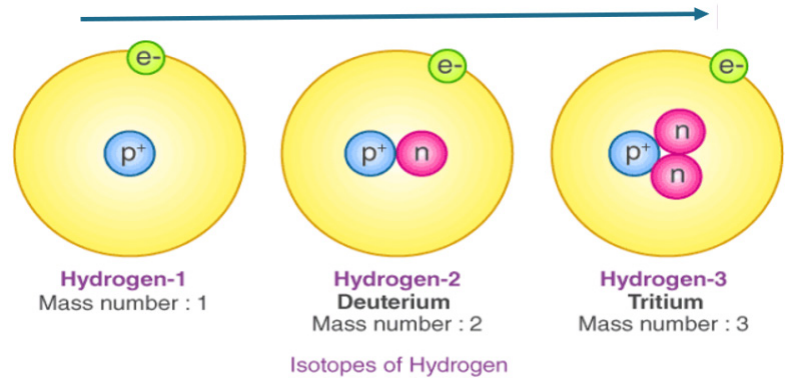
- Grey Hydrogen: Produced from natural gas, releasing CO_2.
- Blue Hydrogen: Like grey hydrogen but with carbon capture and storage to reduce emissions.
- Green Hydrogen: Produced via electrolysis using renewable energy, making it emissions-free.
- Turquoise Hydrogen: Uses methane pyrolysis, yielding solid carbon instead of CO_2.

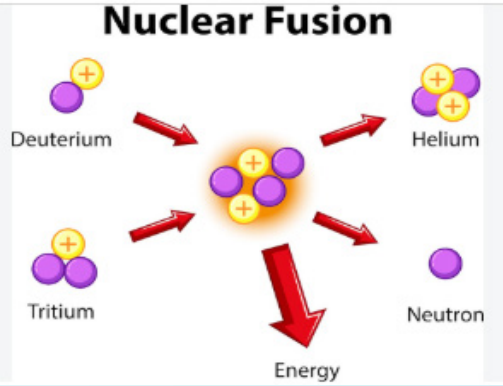
Hydrogen for Sustainable Energy: The Fuel of the Future (From **Fossil Fuels** to **Green Energy**)

Hydrogen is poised to replace fossil fuels in many sectors while reducing greenhouse gas emissions. *"The stone age didn't end because we ran out of stones. The fossil fuel age won't end because we ran out of oil—it will end because we found something better."* – Sheikh Yamani (Former Saudi Oil Minister)

Fusion reactions: Process to power the Sun and other stars. In fusion, two light atomic nuclei combine to form a heavier nucleus. This process releases energy because the new nucleus has less total mass than the two original ones. The lost mass is converted into energy. Einstein's equation ($E=mc^2$) explains this, as it shows that mass and energy can be changed into each other. If scientists find a way to harness fusion energy on Earth, it could become a major source of power.

Fusion can happen with different elements, but researchers are especially interested in deuterium-tritium (DT) fusion, which involves isotopes of hydrogen. DT fusion produces a neutron and a helium nucleus while releasing a large amount of energy—more than most other fusion reactions. Scientists focus on DT fusion because it produces high energy and occurs at lower temperatures compared to other fusion reactions.

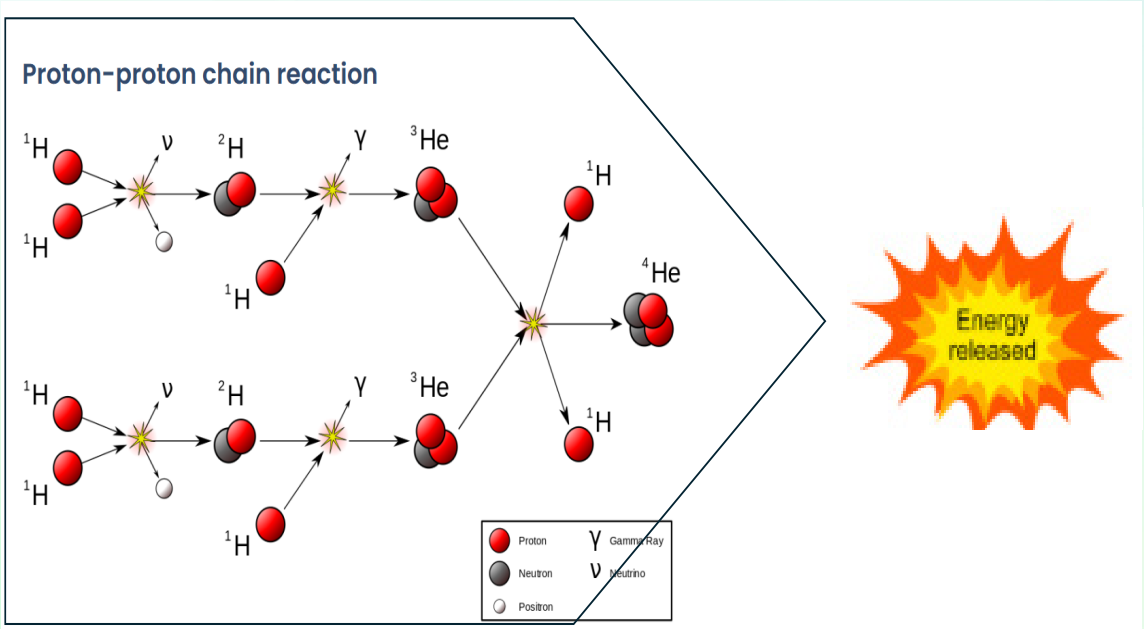




Artificial Sun:

The sun's core is the site of a nuclear fusion reaction that combines hydrogen atoms to create helium

In an "artificial sun," which is essentially a nuclear fusion reactor designed to imitate the sun's process, the primary hydrogen fusion reaction is the merging of two hydrogen isotopes, typically deuterium (^2H) and tritium (^3H), to form a helium nucleus (^4He), releasing a significant amount of energy in the process; this reaction can be represented as: $^2H + {}^3H \rightarrow {}^4He + n + energy$. The reaction is called as Proton-proton reaction.



Scientists worldwide are developing fusion reactors like **ITER** to create a limitless, clean power source for the future.

(*ITER ("The Way" in Latin) is one of the most ambitious energy projects in the world today.)*

Key Benefits & Uses of Hydrogen for Sustainable Energy Source:

Key Benefits:

1. **Zero Emissions:** When used in fuel cells, hydrogen produces only water and electricity.
2. **Energy Storage & Grid Balancing:** Hydrogen can store surplus electricity from solar and wind farms, stabilizing power grids.
3. **Versatility:** Hydrogen can be used in power generation, transportation (fuel cell vehicles), industry (steelmaking, ammonia production), and heating.
4. **Global Push for Decarbonization:** Many countries are investing in hydrogen to achieve net-zero emissions by 2050.
5. **Energy Security:** Hydrogen can be produced locally, reducing dependence on imported fossil fuels.

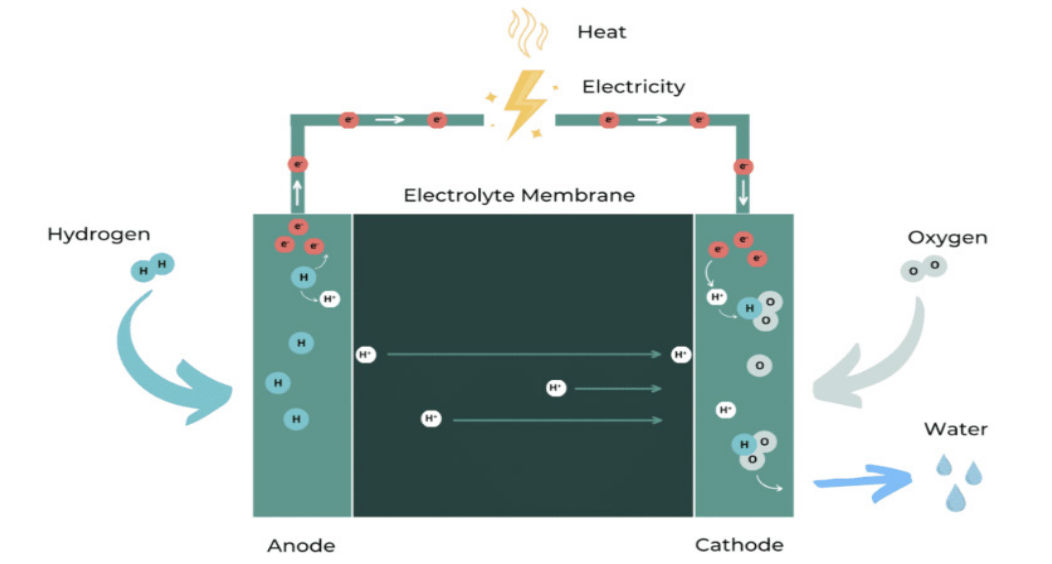
Uses of Hydrogen:

1. **Clean Energy & Fuel Cells:** Generates electricity with water as the only byproduct.
2. **Industrial Applications:** Essential in petroleum refining, ammonia production, and metal processing.
3. **Transportation:** Powers fuel cell vehicles, buses, trains, and aircraft.
4. **Rocket Fuel:** Used in liquid form for space exploration.
5. **Power Storage:** Stores excess renewable electricity.

Hydrogen Fuel Cells: A Clean Energy Breakthrough

How Fuel Cells Work

Hydrogen gas is introduced into the anode of the fuel cell, where a catalyst breaks the hydrogen molecules into protons and electrons. The protons pass through a membrane, combining with oxygen to form water, while the electrons travel through an external circuit, generating an electric current. Finally, the electrons return to the cathode, where they recombine with oxygen and protons to complete the process.



Conversion of chemical energy (H_2) into electrical energy.

Applications:

- Transportation: Fuel cell electric vehicles (FCEVs), buses, trucks, and trains.
- Stationary Power: Backup power, grid stabilisation.
- Portable Power: Electronics and remote applications.

Hydrogen Storage and Transportation

Challenges:

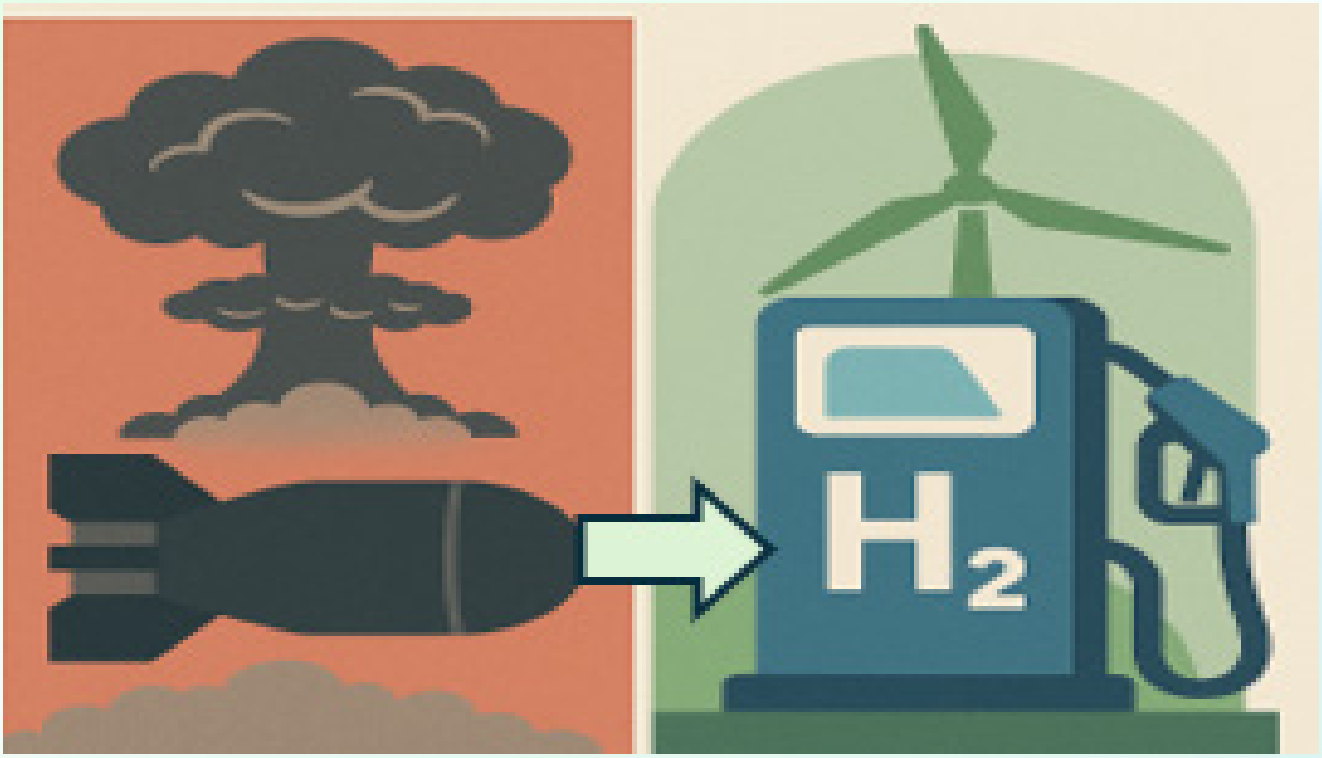
- Low Density: Requires large volumes for storage.
- High Flammability: Safety concerns necessitate strict engineering standards.
- Hydrogen Embrittlement: Weakens certain metals over time.

Storage Methods:

- Compressed Gas: Stored in high-pressure tanks.
- Liquid Hydrogen: Stored at cryogenic temperatures (-253°C).
- Metal Hydrides: Absorbed into metal alloys.
- Ammonia: Easier to transport and convert back to hydrogen.

Real-World Applications

- Hyundai Nexo & Toyota Mirai: Commercially available hydrogen fuel cell vehicles.
- Steelmaking: Hydrogen replacing coal in production.
- Ammonia Production: Sustainable fertilizer production.
- Power Generation: Hydrogen-fuelled power plants for backup and grid balancing.



The Economics of Hydrogen

- Current Costs: Grey hydrogen is cheapest but emits CO_2; green hydrogen is expensive but clean.
- Projected Costs: Green hydrogen costs will decline as renewable energy and electrolyser technology improve.

Hydrogen Safety Measures

- Leak Detection Systems: Essential due to hydrogen's invisible flame.
- Ventilation Systems: Prevent accumulation in confined spaces.
- Explosion-Proof Equipment & Strict Engineering Standards: Ensure safe handling.
- Outdoor Safety Advantage: Hydrogen dissipates quickly in open environments, reducing explosion risks.

Challenges and the Future of Hydrogen:

While hydrogen has immense potential, several challenges remain:

- Storage & Transportation: Requires high-pressure tanks or cryogenic systems.
- Cost: Green hydrogen remains expensive compared to fossil fuels.
- Infrastructure: Widespread adoption requires expansion of refuelling stations and hydrogen pipelines.

With ongoing technological advancements and cost reductions, hydrogen is expected to become a mainstream clean energy source, replacing fossil fuels across multiple sectors.

Conclusion:

Hydrogen has evolved from a feared explosive force to a beacon of hope for sustainable energy. While challenges remain, its potential as a clean, renewable fuel is undeniable. With continued investment and technological advancements, hydrogen could revolutionise the energy landscape, reduce emissions and ensure a sustainable future for generations to come.

"Our choices today determine the climate of tomorrow. Hydrogen is a key piece of the puzzle for a carbon-free future" SB

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Mysteries of Mandala

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Certified Mandala Therapist

In today's article we are going to learn about chakra mandalas, the energy centers which impacts our decision making, actions and reactions. Our physical health is too dependent on the balanced energies of our 7 chakras.

The 7 Chakras are found along the spine, starting at the bottom of the spine, moving up the spine & ending at the crown of the head. When they are balanced and not blocked, these energy centers allow the free flow of life energy, which is called *Prana*. We stay self-balanced in this condition. Here's what to know about this ancient complex energy system.

The history of chakras

With the growth of popularity of Yoga and new age philosophies, chakras have recently become more well known. They are complex and ancient energy system originated in India. They were mentioned in *Vedas* as spiritual knowledge dating from 1500 to 1000 B.C.

Charka (Cakra in Sanskrit) means "wheel" and refers to energy points in our body. They are thought to be spinning disks of energy that should stay "open & aligned", as they correspond to bundle of nerves, major organs and areas of our body that affect our emotional & physical well-being.

There are 114 different chakras, but 7 main chakras run along our spine. Each of these 7 main chakras has a number, name, colour, specific area of the spine, from the sacrum to the crown.

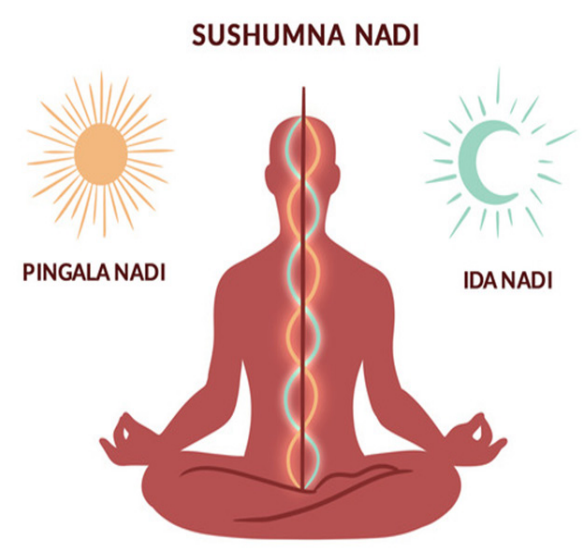
According to Sanskrit, Chakra is a circle and seed of life. Mandala is a process where mind, body equates & brings harmony between them. So scientific studies have proven that the regulation of chakras in the human body is deeply connected to human psychology.

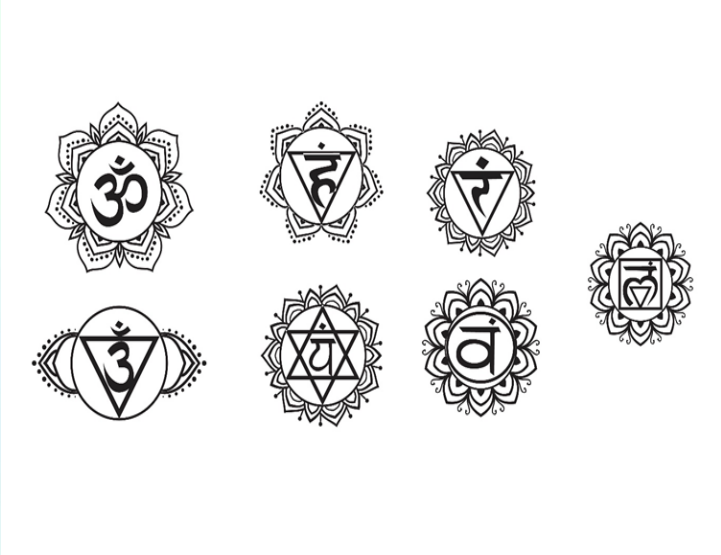
The Universe has 3 functions: creation, protection & destruction. To maintain this rhythm, 2 basic forces *Shiva & Shakti* or *Prakruti & Purusha* have to be in a perfect union. Shiva is the consciousness and Shakti is the personification of love, affection, care & concern. These 2 are inseparable by nature, just like fire & heat. The *Ardhanarinateshwara Swaroopa* (half woman and half man) is an example. Sometimes the Shakti prevails and sometimes the Shiva prevails. These 2 energies are not just present in our inner world, but also exist in the outer world.

Mandalas plays an important role in Chakras. As mental images serve as a framework for one's knowledge about people, places, objects & events. These are 4 different ways in which mental images are formed. One is person, second is social, third is self and fourth is event. By composing Mandala, with the help of Chakra philosophy, helps to remove toxic images. It brings mindfulness. Our mental schema becomes harmonious by nature after creating a Mandala.

It is important to create balance in Chakras, with the help of mindful Mandala - we learn following insights.

- We will erase mental data which is not necessary to process and will learn to use knowledge appropriately. Memory will be used productively.
- It will help to increase hope & willingness.
- Self-observation & awareness increases.
- You learn not to respond spontaneously.
- It can change how we interpret and perceive the world.
- We start working on our potential and grow taller than the problems.
- Madala is a meditative process that allows to do the activity at a super conscious mind level. So, we start getting reprogrammed & restructured internally.





When we have imbalanced chakras, we feel :

- Anxiety & fear
- Anger & frustration
- Sadness & grief
- Negative self-talk
- Pessimism & hopelessness
- Worry

The entire science is based on the functions of the 3 main energy channels (*Nadis*): *Ida, Pingala* and *Sushumna*.

- Ida (lunar, feminine) relates to the left nostril & left side of body.
- Pingla (solar, masculine) relates to the right nostril & right side of body.
- Sushumna to the Central Axis of the body.

The flow of energy in these 3 channels influences the functioning of our nervous system and affects our outlook, mood & emotional stability.

Following is a very interesting study how organs & energies are associated.

1. **Heart** is associated with feelings like love, compassion & emotions. It is linked with emotional body & relationships.
2. **Lungs** are associated with grief, sadness & emotional release. It is linked with breath and let go nature.
3. **Liver** is associated with anger, frustration & emotional detoxification. It is also linked with emotional balance & purification.
4. **Kidneys** are associated with fear, anxiety and emotional stability. It is linked to the sense of grounding.
5. **Stomach** is associated with digestion, nourishment & emotional processing. It is linked to self-nourishment and self-care.
6. **Brain** is associated with thought, logic & mental clarity. It is linked to the mind & intellectual pursuits.

So, when you get this mindfulness through learning Mandalas, it helps people live more sustainably like,

- Artists use recycled paper, plant-based dyes & bamboos to reduce waste & pollution.
- Making Mandalas promotes mindfulness, which leads to more eco-conscious habits.
- Digital tools applications cut the material waste by up to 40%, makes it a greener option.

A mindful Mandala practice to sustainability involves this art into wellness programs to enhance to enhance employee well-being, which can foster a more sustainable mindset & behavior. This approach can reduce stress, boost creativity & promote a healthier work environment, leading to increased productivity & engagement. SB

The Digital Dilemma: Navigating the Effects of Reel Connections on Children's Cognitive Development

The impact of reel connections on children's cognition is a complex issue that warrants attention. Excessive consumption of short-form videos can lead to diminished concentration on longer tasks, impaired critical thinking skills, and memory issues. For instance, a child who spends hours watching short videos might struggle to focus on a 30-minute lecture or complete a homework assignment. This can have long-term implications for their academic performance and cognitive development. Furthermore, frequent exposure to rapid stimuli can hinder critical thinking skills, making it challenging for children to engage with complex narratives and educational content. Children accustomed to quick, bite-sized information might find it difficult to analyse complex texts or participate in deep discussions. Additionally, binging on short videos can affect short-term memory and concentration, leading to difficulties in retaining information or recalling details from a story.

The psychological impacts of reel connections on children are also significant. Short-form videos can trigger a dopamine response, leading to instant gratification and potential addiction. Children might feel compelled to check their phones constantly for new videos, experiencing withdrawal-like symptoms when unable to access them. Exposure to curated content can also lead to feelings of inadequacy, low self-esteem, and increased anxiety. Children comparing their lives to others' highlight reels might feel inadequate or unhappy with their own lives.

Extended exposure to reel connections can disrupt the balance of neurotransmitters in the brain, including:

Dopamine: Excessive dopamine release can lead to addiction, impulsivity, and reward-seeking behavior.

Serotonin: Decreased serotonin levels can contribute to depression, anxiety, and mood disorders.

Oxytocin: The lack of face-to-face interaction can reduce oxytocin release, potentially affecting social bonding and attachment.

Sustained engagement with reel connections can contribute to various psychiatric and psychological disorders, including:

Anxiety disorders: Excessive screen time can increase anxiety levels, potentially leading to anxiety disorders.

Depression Social comparison and curated content can contribute to feelings of inadequacy, low self-esteem, and depression.

Attention Deficit Hyperactivity Disorder (ADHD): Excessive screen time can exacerbate symptoms of ADHD, such as inattention and impulsivity.

Sleep disorders: Exposure to screens before bedtime can disrupt sleep patterns, leading to sleep disorders.

Body dysmorphic disorder: Exposure to unrealistic beauty standards can contribute to body dissatisfaction and body dysmorphic disorder.

One reason children might prefer reel connections over real connections is the ease and accessibility of digital interactions. Social media platforms provide a sense of connection without the demands of face-to-face interaction. Children might find it easier to communicate through screens, avoiding the complexities and nuances of in-person relationships. Moreover, the instant gratification and constant stimulation provided by reels can be more appealing than the slower pace of real-life interactions.

To mitigate these effects, parents and caregivers can implement strategies to promote healthy relationships with technology. Setting daily limits on screen time can help balance screen use with other activities. Encouraging sports, arts, reading, and outdoor activities can promote cognitive and social growth. Co-viewing and discussing content with children can foster critical thinking and media literacy. Utilizing parental controls to monitor and restrict content can also help ensure a safe and healthy online experience.

Ultimately, the long-term implications of reel connections on children's cognition and psychological well-being depend on various factors, including the amount of screen time, the type of content consumed, and the presence of mitigating strategies. By understanding these impacts and implementing effective strategies, parents and caregivers can help children navigate the digital world in a healthy and positive way, fostering a balance between reel connections and meaningful real connections.

Jayasri Tangirala, Counselling & intervention Psychologist,founder. Beyond Well-being Yousva.

This is the last article of the series.
The author may be reached at
jayasriramesh@gmail.com for any professional advice.

Announcement

SSB is happy to commence an exclusive section called Sustainability Guidance Cell from March 2025. The objective of the cell is resolving various queries of members in areas of sustainability. The responses would be replied with respect to various queries within 14 days in response to the queries. We request you write to us at ssb@icmai.in. The queries will be selected on "First Come; First Serve Basis".

Mrigashira Nakshatra- This nakshatra is represented by a symbol of deer head and so just like the deer people belonging to this nakshatra are over cautious, always moving and restless to an extent.

Basically they have all the qualities of a deer or antlers and the ruler or the Lord of this nakshatra is Mars and hence they have the qualities of Mars like aggression, restlessness, forward moving etc

The basic characteristics is Speed, Grace and Agility. The deity connected to this nakshatra is Soma - the God of Immortality and who gives the Nectar.

But as all nakshatras have 4 padas or charan and the characteristics of each pada are varying.

Lets discuss the 4 padas of Mrigshira nakshatra.

The four padas or charan belonging to this nakshatra are

Mars-Sun- Here the personality will be forward moving but with a lot of clarity, will have passion for art and art related subjects.

Mars-Mercury- Here the personality will be forward moving but with intellectual capabilities and a good communicator.

Mars-Venus- Here the person will be very passionate about work as well as luxuries in life. And will like harmony above everything.

Mars-Mars- Here the person will be dynamic, aggressive and very straightforward!

The tree belonging to mrigashira nakshatra is Khair or Catechu which is found in this tree and used in Ayurveda.

This tree is easily available in the forests around tropical climates and survives easily in arid weathers.

This tree has medicinal purpose in Ayurveda, its wood is used in traditional rituals and also it is used extensively in sustainable landscaping as it naturally holds on to the soil and it contains an astringent ingredient called Catechu used in Ayurvedic traditional medicines.

A khair tree will enhance the quality of determination and practicality in a Mrigashira Individual.

It is also a beautiful foliage in your landscaped garden.

So go on invite these divine energies in your life!

SB

–Purvi Dalal
Industrial Designer

How Many Trees Does It Take To Make 1 Ton Of Paper?

In the process of making paper, trees are the most critical raw materials. It is estimated that 24 trees to make 1 ton of standard office paper.Recycled paper was created to reduce the environmental impact of paper manufacturing. Paper can be recycled about 5 to 7 times. Data indicates that using one ton of recycled paper can prevent 17 trees from being cut down.

SUSTAINABILITY QUIZ RAPID FIRE ROUND

Five questions on sustainability

1. By ensuring a steady flow of capable leaders, _____ planning contributes to the long-term sustainability of the organization.
2. In the context of Sustainability-linked Bonds, SPT stands for _____.
3. As per Sustainable Development Report 2024, India's rank is _____.
4. Wind or solar powered data centres will help in better aligning the _____ initiatives with ESG objectives.
5. The GHG emissions of Shipping is projected to increase from 1000 MT of Co2 in 2018 to _____ MT of Co2 in 2050.

NO WINNERS FOR THE QUIZ OF MAY 2025 EDITION

CORRECT ANSWERS OF PREVIOUS QUIZ

1.	2.9 tonnes of CO_2
2.	2. 6.7%
3.	GRI (Global Reporting Initiative)
4.	6.37 million
5.	General Data Protection Regulation (GDPR)

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

Call for articles

Sukhinobhavantu is inviting articles on the theme ESG/ Sustainability or related themes for publishing in July'2025 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 July 14, 2025, by email to ssb.newsletters@icmai.in The right for selection of articles vests with SSB. Decision of SSB will be final and binding.

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