



# Green Files

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*July to September 2022 | Volume 43*



लोकहितार्थ सत्यनिष्ठा  
Dedicated to Truth in Public Interest



# Editorial



*The COVID-19 pandemic has reduced the accelerated global pace to realize the vision of Agenda 2030. The High Level Political Forum (HLPF) plays a significant role in channelizing the world back on the path of achieving the Sustainable Development Goals. In this context, this edition of iCED's quarterly newsletter-cum-journal of "Green Files" covers an event by the HLPF which reflected on how recovery policies can reverse the negative impacts of the pandemic on the SDGs and move countries on the path to realize the vision of the 2030 Agenda.*

*This edition also incorporates environmental awareness articles on "Energy-related emissions by buildings and global efforts to curb the emissions" and "Importance of Rainforests in mitigating Climate Change" which include issues related to climate transitions and sustainable development. With a view to disseminate knowledge and share experiences on environmental issues, the 43<sup>rd</sup> volume of iCED's quarterly journal "Green Files", is a cornucopia of diverse environmental themes. We continue some of our earlier features such as a State-Centric look. In this issue we focus on the State of Kerala and a preliminary analysis of critical issues in the state, related to the environment, which can help audit planning to map environmental audit areas.*

*This edition of Green Files also features glimpses of recent environmental news, key events, some print media environmental news items and emerging trends, which can act as a corpus of information for environment audits in particular. The newsletter further covers a gist of the trainings/workshops/other activities at iCED and recent happenings in SAI India and INTOSAI WGEA community during the period July-September 2022. This edition will apprise readers about the conservation efforts of Avifauna by the Mangalajodi Ecotourism Trust, Odisha under the section "Green Initiatives". In "From the Archives" spot we have featured an article of Ms Sumedha Amar, Sr.DAG, O/o Pr.AG(Audit), Chandigarh on "Future is Digital". To enthuse about environmental awareness, we have continued to feature a Cross Word*

*As is the trend in previous editions, we showcase selected Environment Audit Reports of both a national and international nature. The "Joint Report on Results of the International Audit on Waste Management and Utilization (2020)" highlights important findings and conclusions, compiled by the SAIs of the Republic of Moldova, the Republic of Serbia, and Ukraine. The Performance Audit of Bio-Medical Waste Management in West Bengal (Report No. 1 of 2020) highlights key findings and recommendations pertaining to the status, treatment and disposal and associated risks to the environment and health posed by Bio-Medical Waste in the State of West Bengal.*

*A list of References is also included in this newsletter to provide further reading material on featured themes. Recently we have uploaded some useful reference material and case studies on Environmental issues on the web-site. The links to these are available in the "Research Articles from iCED Research" section. Under this spot, readers can also access the articles which have been contributed by iCED, Jaipur for the ASOSAI Journal, "Asian Journal for Government Audit" editions.*

*On behalf of the entire team of "Green Files" at iCED, we strive to showcase various environmental issues and look forward to your suggestions to make Green Files more informative and user friendly. Your contributions within the broad scope of the newsletter will be highly appreciated, including any feedback you may like to share on the featured articles.*

**Sayantani Jafa**

**ADAI and Director General,  
iCED, Jaipur**

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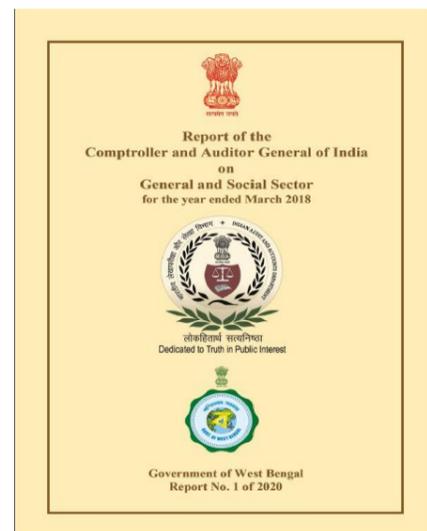
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## SAI INDIA/ICED/INTOSAI WGEA NEWS

by Kailash Bajya, AAO & Pawan Meena, AAO

### 1. Audit of Sustainable Development Goals is one of the major challenges of work for the Supreme Audit Institutions, says the C&AG

A three-day Annual Knowledge Sharing Committee (KSC) meeting was held in Cairo from 12<sup>th</sup> to 14<sup>th</sup> September 2022, which was hosted by the Accountability State Authority of SAI Egypt. The meeting was attended by delegates from about 16 Supreme Audit Institutions. The meeting was inaugurated by Shri Girish Chandra Murmu, Comptroller and Auditor General (C&AG) of India.



*Shri Girish Chandra Murmu, Comptroller and Auditor General of India (centre) along with the Heads of delegation, from Niger, Philippines, Brazil, Egypt, Qatar and Kenya (left to right) at the 14th KSC SC Meeting held in Cairo, Egypt from 12th to 14th September, 2022*

During the meeting, Shri Murmu said, “KSC Working Groups have brought out 11 documents developed covering a variety of people-centric issues, such as the audit of plastic waste, sustainable transport, climate financing, audit of sustainability issues, cyber security and data protection, audit of IT Governance, debt authorization, stolen assets recovery, and corruption prevention in public procurement.” He stated that one of the major challenges of the work of Supreme Audit Institutions is the audit of Sustainable Development Goals since the needs for sustainability and development needs are to be judiciously balanced. The Comptroller and Auditor General of India underlined the role of KSC in filling the gaps by bringing out valuable products in several areas

of public sector audits. He exhorted the members to keep abreast of global megatrends and strategically equip themselves to audit challenging areas such as Artificial Intelligence, climate financing, forensic auditing, fraud and corruption, climate change etc. where the practice of auditing is difficult and the processes are yet to be established.

### 2. SAI India and SAI Morocco sign a Memorandum of Understanding to boost audit capacity building and to foster bilateral relations

Shri Girish Chandra Murmu, Comptroller and Auditor General of India and Zineb El Adaoui, the primary President of the Court of Accounts, Morocco signed a Memorandum of Understanding (MoU) at Rabat on September 16, 2022. Both the SAIs have determined to develop and strengthen their institutional skilled capacities and share methodologies within the area of public audit and agreed to conduct coaching programmes of their respective international locations and discover different techniques of capacity improvement. Shri Murmu stated that this MoU is a reaffirmation of the values and targets that each establishments have shared over a protracted interval and a cementing of the ties that exist already between the two nations. He highlighted that SAI India’s Centre for



*CAG of India, Shri Girish Chandra Murmu and First President, Court of Accounts of Morocco H.E Zineb EL Adaoui signed a MoU for cooperation between the SAIs in the field of Public Audit, on 16th September, 2022*

Data Management and Analysis (CDMA) has been supporting many SAIs inside and outdoors to improve their capabilities with the usage of information analytics within the area of public sector audit. Shri Murmu outlined that, the International Centre for Environmental Audit Sustainable Development (iCED) has also been working with other SAIs and different worldwide organisations for capacity improvement initiatives within the area of Environmental Audit and Sustainable Development. He further highlighted the energetic participation of SAI Morocco within the working group on Environmental Audit which has resulted in two reference guides. Shri Murmu, expressed his keenness to strengthen the bilateral cooperation with SAI Morocco assuring them to energize the capacity improvement initiatives between SAI India and SAI Morocco.

### **3. International Webinars/ National Workshops and National Training Programmes held at iCED, Jaipur**

International Centre for Environment Audit & Sustainable Development (iCED), organized an International Webinar on “Clean Water and Sanitation” for two batches of participants on 26th & 27<sup>th</sup> September, 2022 through virtual mode. Ms. Sayantani Jafa, Additional Deputy Comptroller & Auditor General & Director General (iCED) inaugurated the workshop. A total of 47 participants from 14 SAIs participated in this webinar. Dr. Nupur Bahadur, Fellow & Area Convenor, Water Resources Division (TERI) delivered the session on “Overview of Clean Water and Sanitation with respect to SDG 6”. Using snapshots/ data/ graphs, she enlightened the participants about the water sector and also discussed key drivers for ensuring industrial water security with special reference to India, intangible benefits of clean and green, etc.

Experience on “Audit of Clean Water and Sanitation in India” was shared by Shri Pushkar Kumar, Director, Training & Research (iCED). He delineated various themes connected to water and sanitation covered in audits by SAI India. He also discussed the highlights/key points of Performance Audit Reports on National Rural Drinking Water Programme, Groundwater Regulation and Management, *Namami Gange* Programme, Water Pollution by Industries, Sewage Management in Urban settings, Construction of



*Ms Sayantani Jafa, ADAG, iCED inaugurating the International Webinar on “Clean Water and Sanitation” and participants of National Workshop on “Food Security and Sustainable Agriculture”.*

Toilets in Schools by Central Public Sector Enterprises besides others. He outlined some common audit findings covering the issue of inventory, planning and financial management, project/ programme implementation and outcome of various initiatives in terms of impact on water quality.

Ms. Els Brems, Principal Auditor, European Court of Auditors (ECA) also shared her audit experience regarding the “Performance Audit on Water Use in Agriculture” and briefed about the reasons for conducting the audit, audit scope, audit approach, audit observations and audit recommendations.

One day National Workshop on the theme: “Food Security and Sustainable Agriculture” was held on August 29, 2022 involving 13 Senior IA&AS officers including Heads of Departments. Ms. Sayantani Jafa, Additional Deputy Comptroller & Auditor General inaugurated the workshop. During this workshop, experts deliberated on critical issues and shared their knowledge and experience about Food Security and Sustainable Agriculture.

Dr. K. Y. Reddy Vice President, International Commission on Irrigation & Drainage (ICID) made a presentation on “Water Management for Sustainable Agriculture and Food Security”. He discussed a case study on Banana and various water saving crop production technologies

Ms. Shanal Pradhan, Programme Associate, Council on Energy, Environment and Water (CEEW), New Delhi briefed the participants about the structure and components of the



Participants during the National Training Programme on “Audit of Mining and other Extractive Industries”.



Participants during the National Training Programme on “Environment Audit”



National Mission for Sustainable Agriculture (NMSA). Dr. Vibha Dhawan, DG, TERI, New Delhi gave a presentation on “Smart Agriculture: Use of Technology in Sustainable Agriculture” and highlighted the current challenges affecting the global food system. Dr C S Murthy, NRSC, ISRO, Hyderabad discussed about the use of Geospatial Technologies in Crop Insurance and Smart Sampling in Crop Insurance. Shri Murthy enlightened the participants about the geo-tagging of assets and analytics and how Monitoring of Integrated Watershed Management Programme (WDC-PMKSY) Watersheds can be done with the help of Geographical Information System.



iCED, Jaipur also conducted the following three National Training Programmes during the July-September quarter.

- A five days National Training Programme (NTP) on “Audit of Mining and other Extractive Industries” was conducted from July 04 to July 08, 2022. The NTP was attended by 12 participants from the audit offices around the country. Distinguished experts conducted sessions on Mining & Extractive Industries with emphasis on mining and extraction of crude oil and natural gas, Mining Policy, Legislative and Governance Framework and recent developments in mining Laws, “Environmental Impacts of Mining and Sustainable Development Framework for Mining”, “Sustainable Mining, Impact of Mining on Biodiversity”, “Environmental Management System and Sustainable Development in Mining Operations”, “Socio-economic Impact of Mining on Rural Communities” and “The Use of GIS/RS in Mining Sector”.
- The National Training Programme on “Audit of Climate Change, Disaster Management and Sustainable Agriculture” was conducted from August 01 to August 05, 2022. During the training programme speakers and domain experts deliberated on topics such as “Climate Change and Sustainable Development Goals”, “Socio-Economic Impact of Climate Change with special reference to India”, “Smart Agriculture: Introduction of Technology in Agriculture sector to make it Sustainable”, “National Action Plan on Climate Change (NAPCC): Approach and Achievements” Climate change” and “Hazard Assessment and Framework for Disaster Management in India”.
- Sessions on Disaster management with specific reference to the State of Nagaland and on the utilization of Remote Sensing Applications in Disaster Management with domain experts from the AG (Audit) Nagaland Kohima and the Disaster Management Support Division of National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO), Hyderabad were also held.

- A five days National Training Programme on “Environment Audit” was conducted from September 05 to September 09, 2022 involving 13 participants with sessions on “Environment: A Holistic Approach” and on “GIS and Remote Sensing and its use to conduct Environment Audits”.

Moreover, sessions on themes such as “Auditing Management of Solid Waste”, “Environment Impact Assessment Notification - process to identify and evaluate the environmental effects of proposed development and industrial projects”, “Framework and Implementation of SDG 15: Conservation of Biodiversity on Land and Terrestrial Environment”, “Water pollution and human health: Issues and Challenges”, “Air Pollution in India and National Clean Air Programme”, and “Land Management – Restoration and Rehabilitation of Disturbed Areas” and a Performance Audit of Forests and the use of Remote Sensing/Drones for assessment of plantation activities undertaken by the Forest, Environment and Climate Change Department of Odisha, were also delivered by experts and resource persons from various organizations.

#### 4. Organising a High Level Political Forum Side Event

The INTOSAI WGEA organized a side event in the context of the UN High Level Political Forum on Sustainable Development on 15th July with the General Secretariat of INTOSAI and INTOSAI Development Initiative. The event was called “[Accelerating implementation of the 2030 Agenda – The contribution of Supreme Audit Institutions](#)”.

The event showcased specific examples of audit work – at national, regional, and global levels – that contributes to the in-depth review of three of the SDGs under review at the HLPF in 2022, namely SDGs 14, 15 and 17 as well as SDG 16. The WGEA also released [a bulletin on SAI and WGEA action on SDGs 14 and 15](#). The document summarizes WGEA work done with these topics and covers the main audit case findings from WGEA.



*High Level Political Forum Side Event*

#### WGEA Publishes Five New Reports

The INTOSAI WGEA has published its five final Work Packages for the Work Plan 2020-2022. These Work Packages focus on five different thematic areas:

- Work Package 2 on Auditing Plastic Waste which presents audit cases and possible audit questions for auditing plastic waste with a focus on Sustainable Development Goal (SDG) 12 on responsible consumption and production. SAI India is the leader for this Work Package and the International Center for Environment Audit and Sustainable Development (iCED), Jaipur on behalf of SAI India has played a pivotal role in developing this Work Package during the Work Plan period on 2020-2022.

- Work Package 3 on Auditing Climate Finance which focuses on assessing progress towards SDG Target 13.a on climate finance and conducting performance audits on this topic.
- Work Package 4 on Auditing Sustainable Transport which aims to provide an understanding of SDG 11 on sustainable cities and communities and to identify suitable audit approaches for this topic.
- Work Package 5 on Auditing Sustainable Development Goals which explores policy coherence and multi-stakeholder engagement and suggests a move towards a whole-of-society approach to sustainable development.
- Summary of Work Packages 2-5 which aims to enhance the understanding of the Environmental SDGs presented in the other Work Packages as well as interlinkages between them.

All the five Work Packages can be accessed through the link by clicking [here](#).

#### Looking Back at the 30-Year History of the WGEA: Video Out Now

The 30th anniversary of the WGEA was celebrated on July 6, 2022, at the 21st INTOSAI WGEA Assembly. In celebration of the anniversary, the WGEA Secretariat contacted previous WGEA Chairs, Secretaries General, and other key actors to look back at the 30-year journey of the WGEA and has issued a video highlighting major milestones of INTOSAI WGEA. The video can be accessed through the link by clicking [here](#).

## FROM THE ARCHIVES- THE FUTURE IS DIGITAL

by Ms. Sumedha Amar, Sr.DAG, O/o Pr.AG(Audit), Chandigarh

The United Nations has adopted the agenda of Sustainable Development which is defined as development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. Its dimensions are integration of economic, social and environmental objectives. Digitization of the workplace will serve as one of the main initiatives which will help to achieve it. To ascertain its impact, firstly, we need to understand “What is meant by digitization?” It is the conversion of information from paper format to binary data in the form of 0’s and 1’s and storage of the same in electronic

media. It minimizes but does not eliminate human interface in various processes. It has occurred in phases called “Generations”. From mainframe computers of the 1970’s which used to occupy one whole room, we have progressed to electronic devices which fit in the palm of the hand.



Government of India launched the “**Digital India**” project on 1<sup>st</sup> July 2015, to transform the entire ecosystem of public services through the use of information technology, with the vision to transform India into a digitally empowered society and knowledge economy.

It has 3 main vision areas viz creation of digital infrastructure, digital literacy & delivery of services. It has 9 pillars i.e. broadband highways (Bharat Broadband Network Limited), public internet access programme (Bharat Net Programme), mobile connectivity, e. Kranti (e-service delivery), e-governance, information for all, IT for jobs, early harvest programmes, electronics manufacturing.

It aims to increase the use of computers in all sectors of the Indian economy such as agriculture, health, and education etc. by 2019. It has schemes of around Rs. 1 lac crore which will cover all of India’s 600 districts & 2,50,000 villages (approximately). Leading national and international companies will be investing in it along with the government. The programme is to be monitored by the Digital Advisory Group – chaired by the Minister Communications & Information Technology. Every citizen will have a digital identity (Aadhaar).

Our department also has to keep pace with these developments as it has been a cornerstone of the Indian democratic set up, ensuring accountability of the executive to the Parliament/ legislatures and thus being an aid to governance. Its role has been consistently appreciated in several international fora. *Governance becoming more of e-Governance* using latest technologies, business and service models presents challenges and opportunities to the C&AG to play the role of an active catalyst for good governance. In simple terms, our auditee units are mainly government departments and if their records are maintained in the electronic form, then we have to develop the capability to handle them, to be able to audit them.

There are 3 main areas of IA&AD – accounts, audit and administration. In the accounts area, voucher level computerization was implemented in various offices across India around one and a half decades ago. It streamlined the process of preparation of the monthly civil accounts of the State Governments by our AG (A&E) offices & the Finance & Appropriation Accounts too. Now IFMIS (Integrated Financial Management Information System) is being implemented across states which aims to computerize state treasuries. In it, e-vouchers will be received in the AG (A&E) offices.

In audit, there are 2 issues i.e. audit of IT systems & audit in an IT environment. To audit IT Systems of our auditee units, we follow the COBIT (Control Objectives for Information and Related Technologies) framework for IT governance and management. To audit in an IT environment, we need to understand the IT systems of the auditee unit & assess if they are able to fulfill the organizational needs and objectives.

In administration, we have started the BEMS (Budget Expenditure Management System), whereby all bills etc. are cleared and budget management is done in an IT environment. In order to have a streamlined approach in this regard, the department has adopted a Big Data



Management Policy for Indian Audit and Accounts Department (February 2016) and has created a Centre for Data Management and Analytics (CDMA) (June 2016). The center aims to address the need for synthesizing and integrating relevant data from various sources and in various formats to transform data into actionable information using analytical techniques, along with creating capacity to address the major challenges in analytics of relevant data, thus, increasing efficiency and effectiveness of audits. Data Analytic Groups have been set up in all field audit offices to steer work related to data analytics. A capacity development programme has been undertaken to enhance the skills on the same. Simultaneously, the field audit offices are also being equipped with necessary hardware and software for building up enabling capacity to carry out data analytics. The impact of digitization is huge and widespread. It will unleash an e-revolution in the country. It has both pros and cons. The pros are that it promotes the 3Es i.e. economy, efficiency & effectiveness. The whole of India including its 2,50,000 villages can be connected via internet, giving access to the latest

information. The travel times and costs will be saved, as administrative tasks such as applying for a license etc. can be done at the click of a button. It will ensure equity and act as a bridge between the urban and rural areas. Access to public services & employment opportunities will increase, as industries will be set up for manufacturing electronics (make in India) and jobs will be available in the IT Sector (Skill India). Also a paperless office, contributes to the *environmental wellbeing* as deforestation decreases and the pollution due to paper industries also diminishes. It will provide officers with a cleaner and greener environment for work (Swachh Bharat Abhiyaan).

The cons are that it impacts physical health due to overuse of computers. Also people spend too much time using computers leading to social isolation and misuse of internet. However, any scientific progress has both positive and negative effects and it depends on the manner of usage i.e. whether we use it or abuse it.

It is evident from the events all around that *the future is digital*, thus to ensure smooth execution, many aspects at different levels have to be covered. At the national level, the legislative framework has to be strengthened to keep pace with the challenges raised by the new technological developments (IT Act 2000) to ensure security of data and privacy of citizens. Policies have to be framed to encourage both hardware manufacturing and software companies to increase export. The educational institutions have to be set up to train manpower to enable to harness India's demographic dividend using the IT sector. At the organizational level, the compatibility of file formats, stability of IT systems, longevity of the digital documents and data security have to be ensured. Thus, to sum it up, we all have to come together, to make this endeavour a success and realize the dream of India of not only joining the developed countries' club but also to make it an all-inclusive development journey.

**ENVIRONMENTAL NEWS**

*by Saurabh Sharma, AAO*

**India adds 11 more wetlands to the list of Ramsar Sites**

India has added 11 more wetlands to the list of Ramsar sites to make a total of 75 Ramsar sites covering an area of 13,26,677 hectares in the country. The 11 new sites include: 4 sites in Tamil Nadu, 3 in Odisha, 2 in Jammu & Kashmir and 1 each in Madhya Pradesh and Maharashtra. Tamil Nadu has maximum number of 14 Ramsar sites followed by Uttar Pradesh which has 10 Ramsar sites.



*Newly added eleven Ramsar Sites in India*

**The Government notifies Battery Waste Management Rules, 2022**

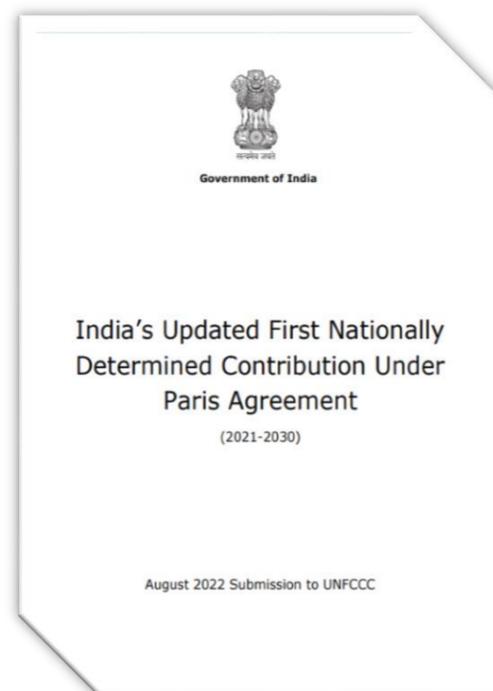
The Ministry of Environment, Forest and Climate Change, Government of India published the Battery Waste Management Rules, 2022 on August 24, 2022 to ensure environmentally sound management of waste batteries. New rules will replace Batteries (Management and Handling) Rules, 2001. These rules function based on the concept of Extended Producer Responsibility (EPR) where the producers (including importers) of batteries are responsible for collection and recycling/refurbishment of waste batteries and use of recovered materials from wastes into new batteries.



Online registration and reporting, auditing, committee for monitoring the implementation of rules and to take measures required for removal of difficulties are salient features of the rules for ensuring effective implementation and compliance. On the principle of Polluter Pays Principle, environmental compensation will be imposed for non-fulfilment of EPR targets, responsibilities and obligations set out in the rules. The funds collected under environmental compensation shall be utilised in collection and refurbishing or recycling of uncollected and non-recycled waste batteries.

**India’s Updated Nationally Determined Contribution to be communicated to the United Nations Framework Convention on Climate Change**

India formally updated its Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC). The updated NDCs seek to enhance India’s contribution towards achievement of the strengthening of global response to the threat of climate change, as agreed under the Paris Agreement.



As per the updated NDC, India now stands committed to reduce the Emission Intensity of its GDP by 45 percent by 2030, from the 2005 level, and achieving about 50 percent of cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. The updated NDC has been prepared after carefully considering the national circumstances and the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC). It also represents the framework for India's transition to cleaner energy for the period 2021-2030 with many

*India's updated first Nationally Determined Contribution under Paris Agreement*

other initiatives of the Government, including tax concessions and incentives such as Production Linked Incentive scheme for promotion of manufacturing and adoption of renewable energy.

### **Commission for Air Quality Management (CAQM) formulates comprehensive policy to abate the menace of air pollution in Delhi-NCR**

The Commission for Air Quality Management in NCR & Adjoining Areas (CAQM) has formulated a Comprehensive Policy to abate the menace of air pollution in Delhi-National Capital Region. This policy contains sector-wise recommendations for Agencies and Departments of Central Government, National Capital Region State Governments and Government of National Capital Territory of Delhi (GNCTD) along with Central Pollution Control Board (CPCB) and State Pollution Control

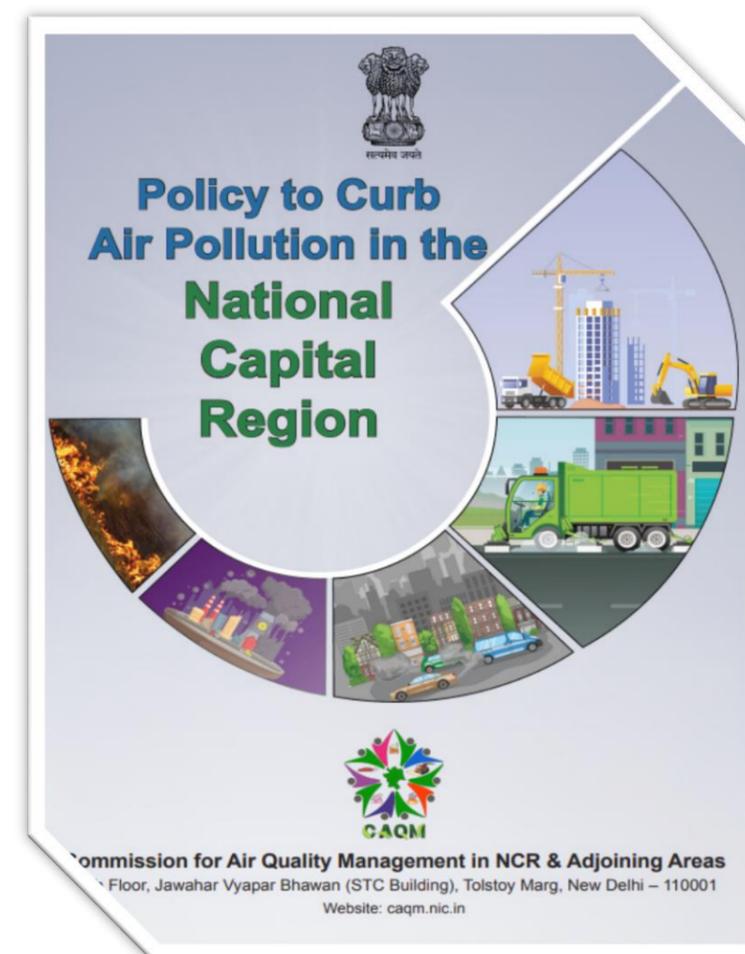
Boards (PCBs) to prevent, control and abate air pollution in the National Capital Region including industries, vehicles/ transport, construction and demolition (C&D), dust from roads and open areas, municipal solid waste burning, crop residue burning etc.

The policy framed by CAQM also deals with thermal power plants (TPPs), clean fuels & electric mobility, public transport, road traffic management, diesel generators (DGs), bursting of fire crackers and abating air pollution through greening and plantation.

The scope of this multi-sector assessment includes industries, power plants, vehicles and transportation, diesel generator sets, dust sources like construction/demolition projects/roads and open areas, municipal solid waste/biomass burning, episodic events like stubble burning, firecrackers and other dispersed sources.

The Expert Group, considering the issues and complexities involved, has suggested short-term (up to one year), medium term (one-three years), and long term (three-five years, preferably) actions. This timeframe is further differentiated for different sub-regions/areas/districts/cities to provide the space for all to transform to meet the common air quality goal.

*CAQM policy to curb air pollution in the National Capital Region*

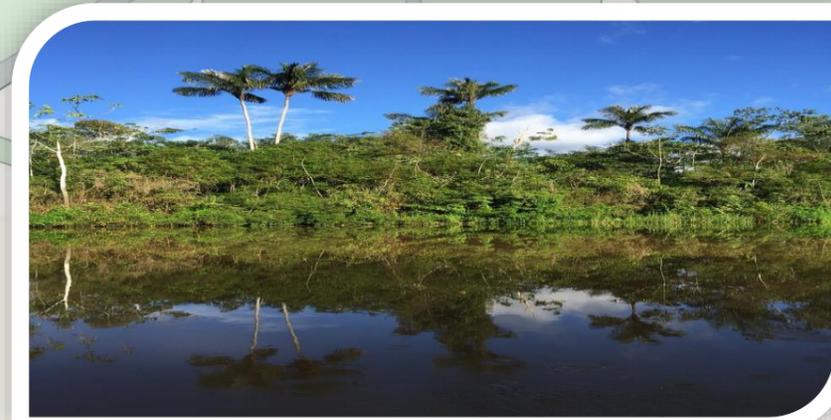


ENVIRONMENTAL AWARENESS DAY'S (JULY – SEPTEMBER)



World Nature Conservation Day

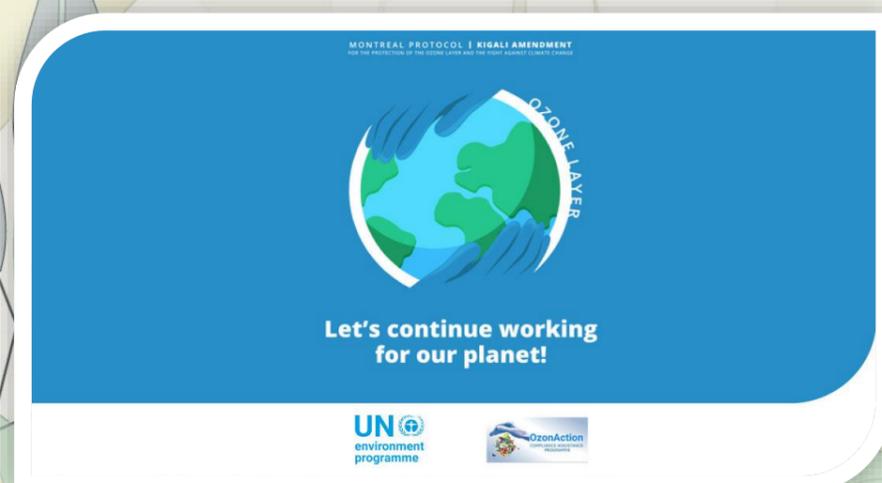
World Nature Conservation Day  
July 28



Amazon Rainforest Day  
September 05



International Day of Clean  
Air for blue skies  
September 07



Ozone Layer Day  
September 07



World Environmental Health Day  
September 07

## HIGH-LEVEL POLITICAL FORUM (HLPF) MEETING HELD IN JULY 2022

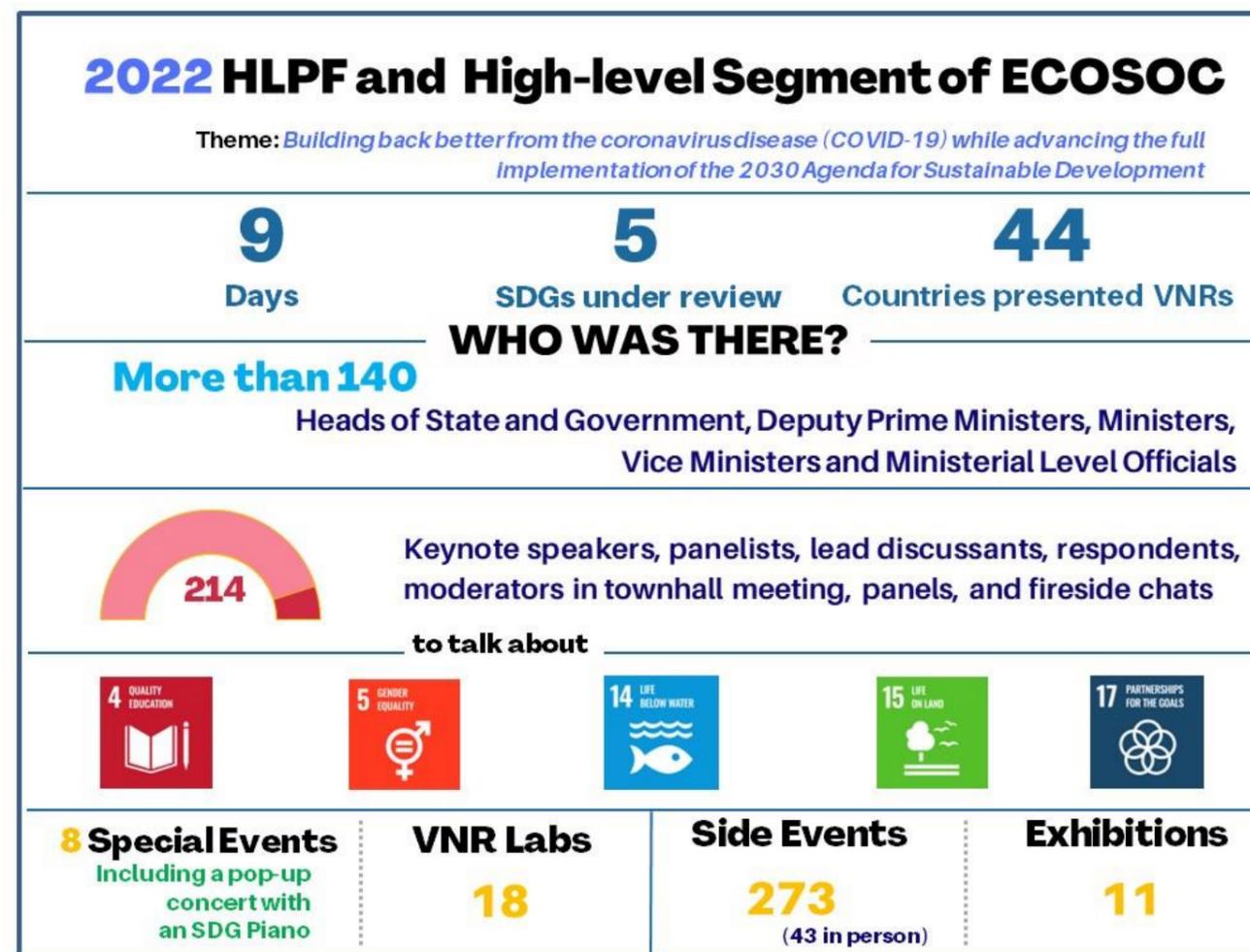
By Vijendra Singh Tanwar, AAO

The High-Level Political Forum (HLPF) meeting was held in New York, from July 5-15, 2022, under the auspices of the Economic and Social Council. The meeting included a three-day ministerial segment of the forum from July 13-15, 2022. The high-level segment of the Council concluded on July 18, 2022.

The HLPF is the main United Nations platform on Sustainable Development and it has a central role in the follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) at the global level. The theme for the 2022 HLPF was **“Building back better from the coronavirus disease (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development”**. The HLPF reviewed in-depth Sustainable Development Goals such as SDG 4 on quality education, SDG 5 on gender equality, SDG 14 on life below water, SDG 15 on life on land, and SDG 17 on partnerships for the Goals. It took into account the different impacts of the COVID-19 pandemic across all Sustainable Development Goals and the integrated, indivisible, and interlinked nature of the Goals.

At the HLPF 2022, forty-four countries carried out Voluntary National Reviews (VNRs) of their implementation of the 2030 Agenda for Sustainable Development at the 2022 HLPF.

The HLPF adopted the Ministerial Declaration (<https://documents-dds-ny.un.org/doc/UNDOC/GEN/N22/455/26/PDF/N2245526.pdf?OpenElement>) as the outcome of its session. The HLPF Ministerial Declaration reaffirmed: that “eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge”; the “importance of achieving global food security”; and that “there can be no sustainable development without peace and no peace without sustainable development.”



The HLPF encouraged all countries to use the key findings of the Voluntary National Reviews and share the locally driven development approaches and pathways, to accelerate actions to implement the 2030 Agenda, including the COVID-19 response and recovery efforts.

The Declaration contained dedicated sections on the “impact of COVID-19 on the 2030 Agenda and actions to recover better while accelerating progress towards the SDGs”, “Goals under in-depth review and VNRs”, “other priority issues,” and “the road map for the way forward.” In September 2023, Heads of State and Governments will gather again at the UN Headquarters in New York to review the implementation of 2030 Agenda.

## STATE IN FOCUS- KERALA

by Manish Mangal, AAO

The state of Kerala is located in the southwestern tip of India between North latitudes 8° 18' and 12° 48' and East longitudes 74° 52' and 77° 22'. It occupies 1.2 per cent of India's land area and three per cent of the country's population inhabits the State. It is cushioned between the Western Ghats on the east and the sandy shores of the Arabian Sea on the west. Its land area is 38,863 Sq. Km, stretching 580 Km in length and 30.130 Km in average breadth. The State is subdivided into 14 districts and 152 blocks and has the highest



Indian state of Kerala

literacy rate in India. Geographically, Kerala is divided in the east-west direction into three parts- Highland, Mid plains, and coastal areas. The area in and around the Western Ghats or Sahyadri are mostly hilly and thick evergreen rainforests. The major rivers of Kerala originate from these highlands.

### Water Resources

Kerala exhibits tendencies of both water abundance and scarcity. The average annual rainfall of the state is 3000 mm, the bulk of which (70 per cent) is received during the

South-West monsoon which sets in by June and extends up to September. However, the spatial and temporal distribution pattern is mainly responsible for the frequent floods and droughts in Kerala. The major water quality problem associated with the rivers of Kerala is bacteriological pollution. The major quality problem in the rivers is due to bacteriological pollution and falls under the B or C category of Central Pollution Control Board (CPCB) classification. There are local-level quality problems faced by all rivers especially due to the dumping of solid waste, bathing, and, discharge of effluents.

With regard to groundwater, the water quality characteristics of wells in Kerala have been found to be affected by chemical and biological contaminants. The groundwater quality problems in coastal areas are mainly because of the presence of excess chloride. In the midland region, the concentration of fluoride iron, and, chloride has been found to be on the higher side. Open wells of Kerala are under threat of bacteriological contamination. Studies have shown that faecal contamination is present in 90 per cent of drinking water wells in Kerala. The open character of the wells, conventional maintenance habits, the use of buckets and rope to draw water, and kitchen waste are some of the factors which are responsible for bacteriological contamination. Groundwater contamination due to industrial pollution has also been reported from places of Kochi (eastern part of Aluva), Palakkad, and some parts of Kollam, Kozhikode, and Kannur.

### Coastal Areas

The coastal zone in Kerala is the low land fringing the sea extending over 560 km, with a height of less than 8 meters from the Mean Sea Level, covering about 15 per cent of the State's total area of 38,863 sq. km. The highly productive coastal and marine ecosystems are affected by the high density of population, coastal erosion, and mining of beach sand for industrial purposes, shoreline changes, destruction and reclamation of wetlands, development-related degradation of the environment, and violation of the provisions of the Coastal Regulation Zone.

### Wetlands

The major wetland types are River/Stream (65162 ha), Lagoons (38442 ha), Reservoirs (26167 ha) and waterlogged (20305 ha). Compared to coastal land, the highland and middle land hold very few wetlands. The State consists of 160.6 thousand hectares (ha) of wetlands i.e. 4.13 per cent of the State. Wetlands, directly and indirectly, support millions of people by providing ecosystem services such as protection from natural hazards, groundwater recharge and discharge, food, fiber and raw materials in addition to educational and recreational benefits. The most prominent threats being faced by the Kerala wetlands include fishing, pollution caused by solid waste and domestic sewage waste.

### Energy

The Power System in Kerala encompasses hydel, thermal and wind sources. Hydel energy is the most reliable and dependable source in Kerala. Of the total installed capacity in March 2021, 2965.66 MW, the share of 2129.42 MW (71.80 per cent) of installed capacity comes from hydel stations; 465.58 MW (15.70 per cent) is contributed by the thermal projects, 300.33 MW (10.13 per cent) from solar and 70.28 MW from wind (2.37 per cent). Monsoon is essential to sustain the hydropower base in the State and the shortage in rainfall usually creates a power crisis.

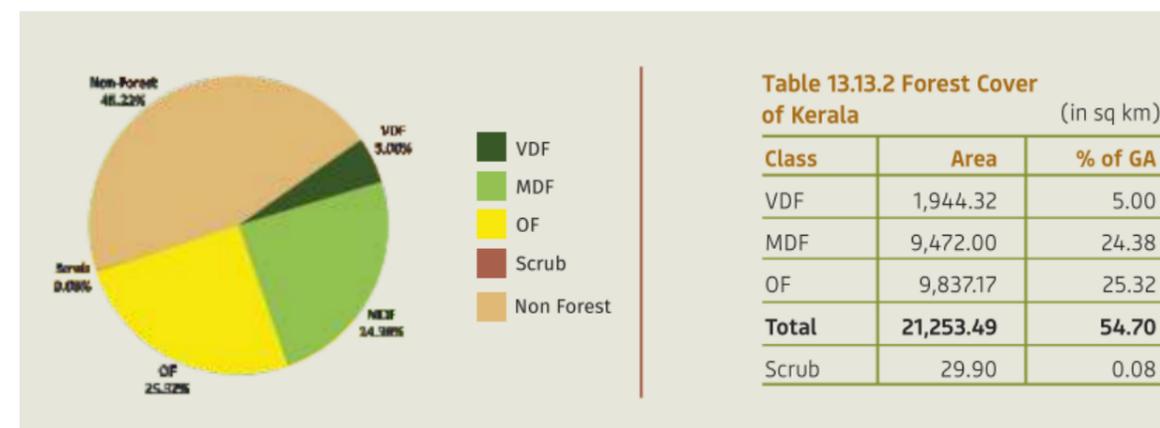
### Biodiversity

The Western Ghats region, wherein the State is situated, is one of the 25 biodiversity hotspots in the whole world. There are about 10,035 plant species indigenous to the State. The state harbors 25.69 percent of flowering plant species and 26.59 per cent of Pteridophytes recorded in India. Herbs constitute 50.1 per cent, shrubs 15.8 percent, and trees 15.08 percent of the total flowering plant species of the State. The State also has 866 species of Algae, 4800 species of Fungi, and 520 species of Lichens. Of the 1,847 vertebrates of Kerala, 205 (~11 per cent) species are listed as threatened in the International Union for Conservation of Nature (IUCN) Red List of ‘Threatened Species’ of which 23 are critically endangered, 90 are endangered and 92 are vulnerable.

The forest cover in Kerala is largely spread over the Western Ghats. As per the Kerala Forest and Wildlife Department the total forest area in the state is **11524.149 Sq.Km**. The percentage of forest area to the total area of the state is **29.65 percent**.

By Legal Status(Area as per records)	
Reserved Forests	6450.913 Sq.Km
Proposed Reserve	285.093 Sq.Km
Vested Forests	1586.147 Sq.Km
Ecologically Fragile Lands	135.812 Sq.Km
Protected Area	3066.184 Sq.Km
<b>TOTAL</b>	<b>11524.149 Sq.Km</b>

As per the Forest Survey of India, the forest cover of Kerala is shown in the figure given below.



### Challenges

**Encroachments:** The direct impact of encroachment is habitat loss, besides the existence of constant threats on the forests by the fringe people. In addition to their involvement directly in illegal activities, they provide shelter for unscrupulous offenders who are engaged in all kinds of illegal activities.

**Cattle grazing:** Excessive grazing not only removes the biomass and competes with wild herbivores but also spread contagious diseases to wild animals. The trampling leads to soil erosion and changes the physical properties of the soil.

Intensive grazing leads to the domination of a single or a few species, changing the species composition of natural vegetation.

**Excessive Collection of Firewood:** Excessive firewood collection enhances the removal of biomass, which affects the microhabitat of flora and fauna, and indirectly leads to extensive fire and other illegal activities.

**Man-Animal Conflict:** Man-Animal conflicts have registered a significant increase in recent years due to habitat fragmentation and the degradation of natural forests and corridors. Almost all the Protected Areas and Non-Protected Areas of Kerala contain a large number of settlements either inside or on the periphery. Animals cause extensive damage to the surrounding crops. As a result, people tend to kill animals either by poisoning or by other means, like keeping crackers in fruits, etc. This problem is very severe in northern Kerala where the cultivation of paddy is extensive.

**Invasive species:** These are non-indigenous or non-native plants and animals that adversely affect the habitats and bioregions they invade economically, environmentally and ecologically. Major invasive species in the state are given in the table below.

Sl. No.	Species	Estimated Extent
1.	<i>Chromolaena odorata</i>	362
2.	<i>Lantana camara</i>	87
3.	<i>Ageratum conyzoides</i>	29
4.	<i>Ageratina adenophora</i>	9
5.	<i>Mikania micrantha</i>	3

**Forest Fires:** Fire is one of the major threats facing the forests of Kerala. Fire causes extensive damage in deciduous forests and grasslands due to heavy fuel loads. The direct impacts of fire are change in vegetation composition and physical properties of soil, soil erosion and loss of habitat. Forest cover under different classes of Forest Cover Proneness is given in the following table.

Sl. No.	Forest Fire Prone Classes	Forest Cover	% of Total Forest Cover
1.	Extremely fire prone	0.00	0.00
2.	Very highly fire prone	54.79	0.26

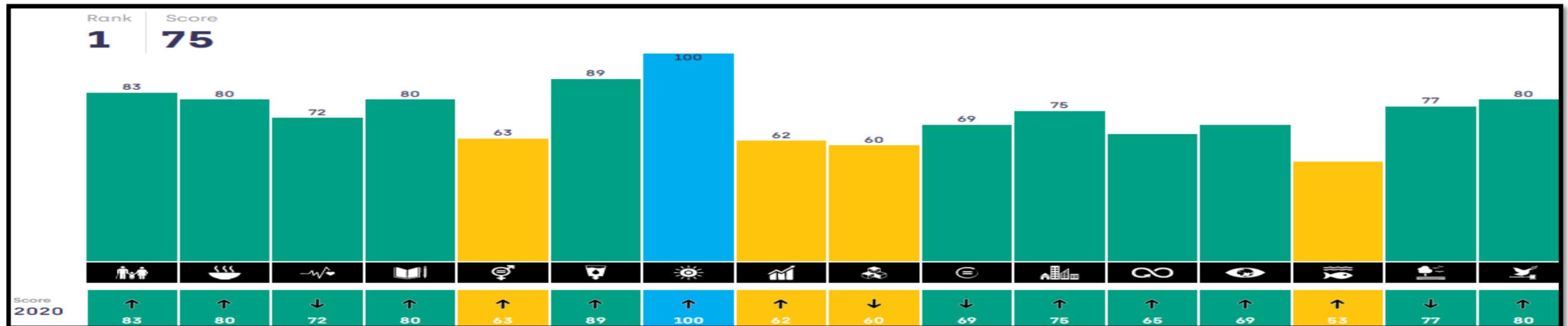
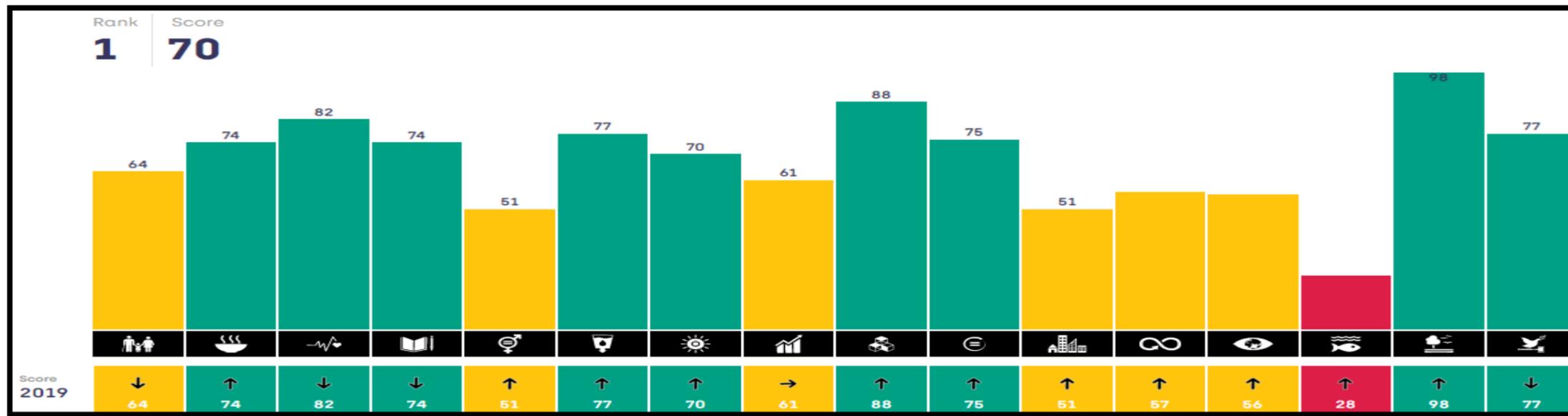
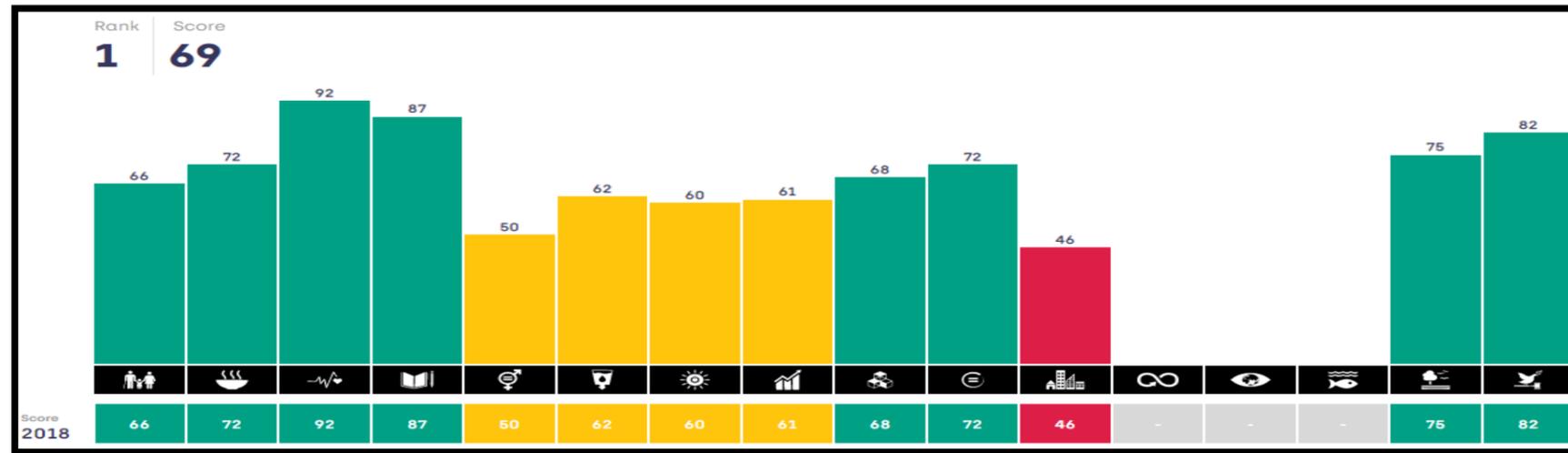
**Mining:** Sand mining is prevalent in the central and southern parts of Kerala. It is a threat to the stability of a landscape, which results in land sliding and lowering of water tables. The removal of habitat endangers the survival of riparian species since most of them occupied a very narrow habitat niche. Indiscriminate sand mining in some river systems in the State is posing severe threat to the stability of bridges and banks. Transportation of sand through the forests and other related activities poses severe threat to the ecosystem.

**Illegal and unsustainable/unscientific collection of Non-Timber Forest Produce (NTFP):** The unsustainable market-driven utilization of NTFP products has led to unsustainable exploitation and resulted in the degradation of the natural vegetation. The forests of Kerala are very rich in NTFP material. Although 500 species of NTFP are available in the forests of Kerala, about 120 items are listed as commercially important by the Kerala Forest Department. But as per the record, more than 200 species are being collected. Considering its widespread nature and higher prioritization, the threat needs to be tackled to conserve biodiversity. Major NTFP species in Kerala are given below in the table.

Sl. No.	Species	Plant Type	Relative Abundance (%)
1.	<i>Hydrocotyle asiatica</i>	Herbs	52.01
2.	<i>Piper spp./Piper longum/Piper mullesua</i>	Climber	29.93
3.	<i>Curcuma zedoaria</i>	Herbs	3.68
4.	<i>Rubia cordifolia</i>	Climber	3.01
5.	<i>Phyllanthus amarus</i>	Herbs	2.68

### State performance under Sustainable Development Goals

As per [SDG India Index Report 2020-21](#) (March 01, 2021), Kerala has the First rank in SDG India Index 2020. Kerala has the composite score of 75, shown in the figures below (an improvement from a score of 70 in the year 2019) among the Indian states with the highest score in SDG 2 (No Poverty) SDG 4 (Quality Education) and SDG 7 (Affordable and Clean Energy). However, the State has recorded the lowest rankings under SDG 12 (Sustainable Consumption & Production). Kerala had also secured First rank in SDG India Index 2019 and SDG India Index 2018.



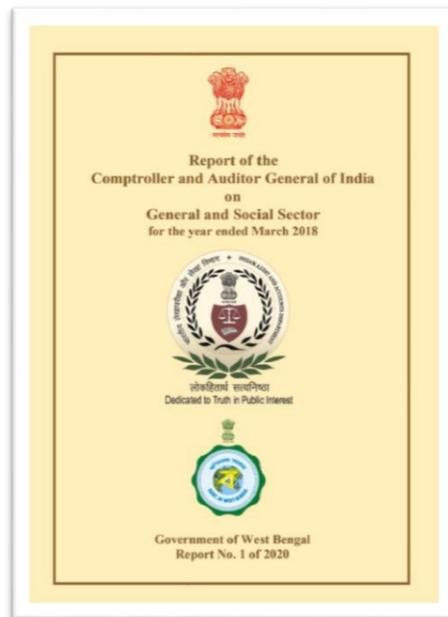
**PERFORMANCE AUDIT OF BIO-MEDICAL WASTE MANAGEMENT IN WEST BENGAL REPORT NO. 1 OF 2020***By Gaurav Jain Sr.AO***Background:**

Waste management is an important factor in safeguarding human health and environmental protection. Improper waste management may cause adverse health problems by spreading infections and diseases and may cause severe environmental problems by polluting the air and the soil, surface water, and groundwater.

**Audit Objectives:**

The audit objectives were to examine whether:

1. Quantum of waste generated had been assessed and risks to the environment and health posed by bio-medical waste identified;
2. Treatment and disposal facilities were adequate in the State;
3. Stakeholders were sensitized and awareness was created among occupiers, operators, and handlers of bio-medical waste;
4. Effective compliance to Rules by the occupiers and operators of the Common Bio-medical waste Treatment was taking place in the State;
5. Monitoring was effective in checking compliances; and
6. Manpower was adequate and accountability determined.

**Audit Scope:**

Performance Audit was conducted for the period 2013-14 to 2017-18. The scope of the Audit included the examination of the records of the Health and Family Welfare (H&FW) Department, Environment Department, West Bengal Pollution Control Board (WBPCB) along with its Waste Management Cell (WMC), Animal Resource Development (ARD) Department, Correctional Administration (CA) Department and Home & Hill Affairs (H&HA) Department.

**Audit Criteria:**

1. Relevant provisions under Environment (Protection) Act, 1986;
2. Provisions under Bio-medical waste (Management and Handling) Rules, 1998 and Bio-medical waste Management Rules, 2016;
3. Guidelines issued by the Central Pollution Control Board (CPCB) for bio-medical waste management;
4. Guidelines/ orders/ instructions issued by WBPCB; and
5. Orders/ circulars/ instructions issued by the H& FW Department relating to the management of bio-medical waste.

**Major audit findings:****Quantification of bio-medical waste and assessment of risk**

It was observed by audit that no internal bio-medical waste control system was set up in the hospitals. The hospitals were not in a position to determine the amount of bio-medical waste produced or control the flow of such waste. The West Bengal Pollution Control Board (WBPCB) did not establish a system or devise a mechanism whereby it could establish linkages between the departments and integrate data for developing a dependable inventory of bio-medical waste generating units.

**Adequacy of waste treatment facilities**

Bio-medical waste treatment facilities were grossly inadequate and consequently overburdened. The West Bengal Pollution Control Board (WBPCB) reported unrealistic figures for the treatment of bio-medical waste in its Annual Reports, which was even beyond the installed capacity of the Common Bio-Medical Waste Treatment Facilities (CBMWTFs). As a result, the bio-medical waste to a large extent remained untreated, posing a threat to the environment and health.

**Sensitization and creating awareness**

No awareness camp/ training for the stakeholders was organized by the West Bengal Pollution Control Board (WBPCB) in coordination with Health and Family Welfare (H&FW) Department and the training for generators and handlers of bio-medical waste was also found to be deficient.

**Handling of bio-medical waste by HCFs and CBIO-MEDICAL WASTETFs**

Segregation and storage of bio-medical waste before disposal, at Health Care Facilities (HCFs) and Common Bio-Medical Waste Treatment Facilities (CBMWTFs), was grossly inadequate and irregular. Disposal of highly infectious blood samples was appalling, bio-medical waste was disposed of with Municipal wastes, and bio-medical waste was heaped directly in front of incinerators without colour segregation with blood and body fluid leaching from waste.

**Collection and Transportation of bio-medical waste by Common Bio-Medical Waste Treatment Facilities (CBMWTFs).**

The objective of framing criteria of daily collection and safe transportation of bio-medical waste was frustrated while bio-medical waste was left untreated beyond 48 hours and transported in hired and uncovered vehicles exposing the environment to risk of contamination.

**Treatment and disposal of veterinary waste and other waste by other Health Care Facilities (HCFs) and Common Bio-Medical Waste Treatment Facilities (CBMWTFs).**

Veterinary and other waste remained untreated in the State. There was irregular burning and disposal in unauthorized burial pits. Highly infectious wastes not pre-treated and untreated liquid chemical wastes were mixed with general effluents.

**Recommendations:**

1. The WBPCB needs to establish linkages with concerned departments for developing a comprehensive, reliable and dynamic inventory of occupiers and data on

bio-medical waste generation, treatment and disposal; and enforce the requirement of all Health Care Facilities to maintain and update on day to day basis the bio-medical waste management register and display the annual report on its website colour coding as specified.

2. The gap between the requirement and availability of treatment facilities needs to be analyzed based on realistic figures of bio-medical waste generation and an Action Plan prepared for setting up more treatment facilities on an immediate basis.

3. Creating awareness among all the stakeholders for ensuring compliance of bio-medical waste management Rules.

4. The WBPCB and the controlling Departments need to take up urgent upgradation of physical infrastructure along with raising awareness;

5. Health check-ups, immunization, and provisioning of personal protective equipment for healthcare workers and others handling bio-medical waste need to be prioritized.

6. The WBPCB should ensure strict adherence by the Common Bio-Medical Waste Treatment Facilities (CBMWTFs) to the provisions of the Rules and CPCB guidelines by fully implementing the GPS tracking and monitoring of bio-medical waste-carrying vehicles.

7. The WBPCB should ensure strict compliance on the part of the common treatment facilities by ensuring immediate connectivity of online monitoring systems of flue gas emissions, movement of bio-medical waste carrying vehicles, etc.,

8. The Government may adopt the 'Polluter Pays' Principle and influence the amount of waste generated through economic incentives, whereby the efficient use of resources and the limited generation of waste are rewarded. To motivate the desired behaviour among waste generators, economic incentives ought to be used, such as tax exemptions, the lower license fee for fully compliant operations, etc.

9. Strict enforcement and strong control mechanisms need to be in place with better inter-departmental co-ordination.

## TRENDING TERM-IN-KNOWLEDGE-IES

**A**tlantification This refers to the hotspots that have been discovered in some parts of the Barents Sea which have started to closely resemble the Atlantic due to the transportation of warm waters of the Atlantic to the Arctic Ocean through the Barents Sea. ‘Atlantification’ has been leading to the warming of the Arctic region near Norway as much as seven times the rate of warming in the rest of the world.

1

**K**arakoram Anomaly Himalayan glaciers are fast receding under the impacts of global warming, and stifling stress on water resources is inevitable in the coming decades. In contrast, the glaciers of central Karakoram have surprisingly remained unchanged or slightly increased in the last few decades. This is called the Karakoram Anomaly. This phenomenon has been puzzling glaciologists and providing climate deniers with a very rare straw to clutch at.

2



Satellite view of Karakoram Range. Source- Google Earth Maps

**E**colinguistics It is a general term for a field of research that studies the effect of language on the environment and the effect of the environment on language. This field of research investigates issues such as the loss of languages due to people being made climate refugees by climate change.

3

## ENVIRONMENTAL SNIPPETS

By Jayant Sharma, Consultant

**Large residential buildings will have to get 25 per cent of their energy needs from green sources** (*The Times of India August 14, 2022*)

The residential buildings have been included to source 25 per cent of their energy consumption from renewable sources. A bill in this regard has now made it mandatory for large residential buildings to use 25 per cent of their energy consumption from renewable resources.

**India exploits more groundwater than China and America together** (*August 20, 2022*)

Although India has 18 per cent of the planet's population, it has only 4 per cent of the earth's freshwater resources. India has become a country that exploits more groundwater than China and the United States together and it is estimated that by 2025, the availability of groundwater in large parts of North-West and South India will be greatly reduced.

**Ladakh set to get a geothermal power boost** (*The Times of India August 22, 2022*)

Oil and Natural Gas Commission (ONGC) and Iceland's engineers have embarked upon a journey to generate electricity on a utility scale by tapping steam gushing from the earth's bowels at Puga (Ladakh) a remote valley located at an altitude of over 14,000 feet. This project will be India's first geothermal energy project and also the world's highest. It will boost Ladakh's potential to emerge as one of the country's clean energy bowls by expanding the area's horizon beyond solar or wind power.

**IIT-Kanpur setting up air-quality sensors** (*The Kaagaz July 11, 2022*)

To bolster the measurement of air pollution in rural India, IIT Kanpur is embarking on a \$ 2.5 million project to install nearly 1400 air quality sensors in the rural blocks of Uttar Pradesh and Bihar. The three-year project could pave the way for a national network

of air quality sensors in rural India. The outcomes from this network will help local communities, policymakers and researchers understand the ground situation.

**India has achieved clean energy targets nine years before the deadline** (*The Kaagaz July 14, 2022*)

India has achieved clean energy targets nine years ahead of schedule. In 2015, India committed to ensuring that 40 per cent of its energy would be from renewable sources by 2030 as part of its Nationally Determined Contributions (NDC). India has installed 162 GW of renewable energy capacity, which is 41 per cent of the 402 GW of electricity installed.

**Millets can help mitigate climate impacts on food** (*The Times of India September 24, 2022*)

Millets can be a way forward among farming and food options which can help us mitigate climate impacts. The millets are rich sources of macronutrients and micronutrients. These also have a low glycaemic index (GI) property which can help prevent the occurrence of Type 2 diabetes.

Millets require only one-third of the water needed to grow rice, wheat and sugarcane. The latter also need more fertilisers and pesticides while millets can grow well in relatively arid environments with less irrigation and fewer inputs. The United Nations has declared 2023 as the 'International Year of Millets'.

### The Game changers

Nalleli Cobo led a coalition to permanently shut down a toxic oil-drilling site in her community in March 2020, at the age of 19—an oil site that caused serious health issues for her and others. Her continued organizing against urban oil extraction has now yielded major policy movement within both the Los Angeles City Council and Los Angeles County Board of Supervisors, which voted unanimously to ban new oil exploration and phase out of existing sites.



*Nalleli Cobo  
The Goldman Environmental  
Prize 2022 Winner*

## GREEN INITIATIVES - CONSERVATION OF AVIFAUNA BY THE MANGALAJODI ECOTOURISM TRUST, ODISHA

by Lokesh Kumar Meena, AAO

### Introduction

Mangalajodi is a village coming under the Tangi block of Khurda district in the Indian state of Odisha. It has a marshland along the northern edge of Chilika Lake which is primarily a freshwater zone connected by channels cut through the reed beds with the brackish water of Chilika lagoon. Mangalajodi attracts birds from all across the globe. Many species of the birds such as grebes, cormorants, shags, herons, egrets, bitterns, storks, ibises, geese and ducks, raptors, pheasants, etc. come from different countries making it one of the best bird-watching spots in the entire Chilika lake region.

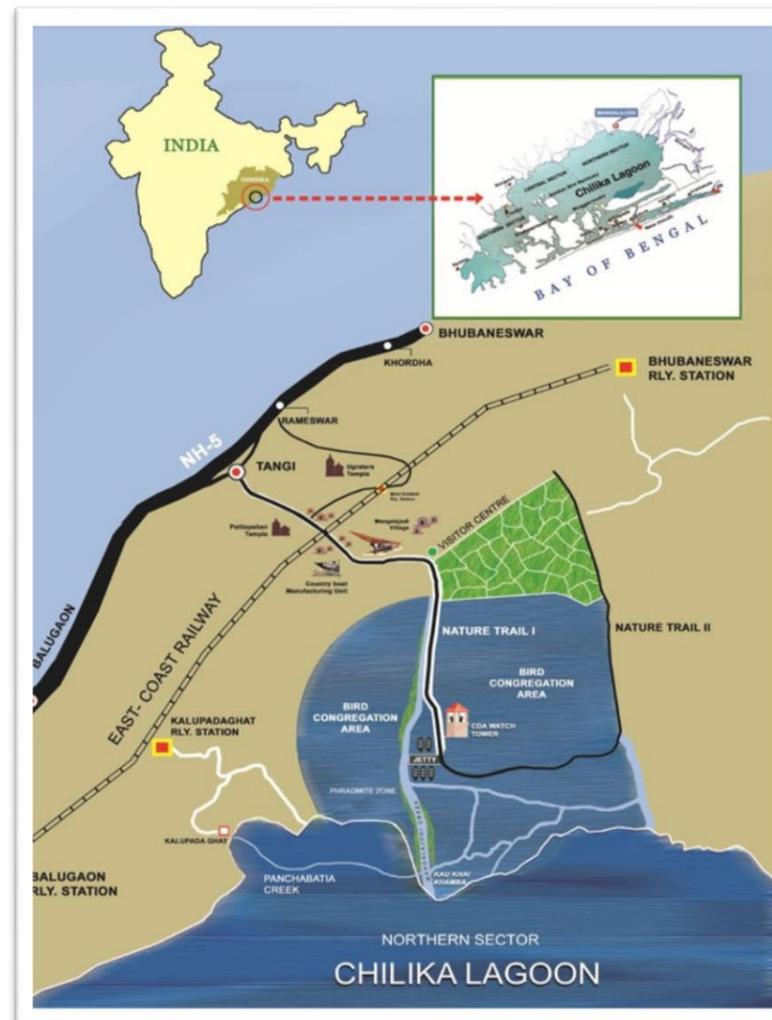
Mangalajodi has emerged as a major center of ecotourism owing to the assemblage of diverse avifauna in its wetland. This thrust has been provided by the Mangalajodi Ecotourism Trust (MET), a community-owned and managed venture which is supported by the Indian Grameen Services (IGS).

### Need for Conservation Efforts

Until the year 2000, the people of Mangalajodi were involved in hunting, eating, and selling the meat of the water birds. They also resorted to poaching by poisoning, which led to killing of many bird species in the region. This led to a considerable decrease in the bird census. The year 2000 showed a mere 5,000 birds as compared to an earlier recorded population of 300,000 during the peak migratory season.

### Awards and Recognition

- Recipient of India Responsible Tourism Awards under 'Best Wildlife Stay' category in 2019.
- Winner of 14th UNWTO Awards for innovation in Enterprise in 2018.
- Special Mention in the India Biodiversity under the category 'Community Stewardship' in 2014
- Winner of RBS Earth Hero Awards in 2012.



Guide map of Mangalajodi Wetland



Migratory birds at Mangalajodi Wetland

### Conservation by Mangalajodi Ecotourism Trust (MET), a community-owned initiatives

The Indian Grameen Services (IGS) formed the Mangalajodi Ecotourism Trust (MET) in 2010 to conserve wetland biodiversity by inhibiting poaching activities, reserving the ecosystem, and sustaining livelihoods by providing income-generating opportunities via ecotourism.

The Mangalajodi Ecotourism Trust took the following steps to save the wetland:

- The trust conducted an awareness programme to educate the locals about the harmful effects of poaching and its impact on the future well-being of the community.
- In collaboration with the forest department and the Chilika Development Authority, the trust established a network of patrolling corridors using the natural waterways and traditional boats.

- Any incidents of poaching or bird poisoning and trapping were informed to the concerned authorities.
- The Mangalajodi Trust helped the local community in establishing an infrastructure for ecotourism by building tourist cottages, dormitories and tents. There were efforts towards encouraging the local people to use their knowledge of local flora and fauna and earn a living as tourist guides.

### **Impact of conservation efforts**

The conservation efforts of the Mangalajodi Trust have shown a considerable ecological and economic impact in the wetland region. Due to the conservation efforts, poaching activities in the region have declined considerably. The Population as well as the variety of birds in the region has also risen. Increased deposits of guano in the water have led to a rise in aquatic diversity with fish species. On the economic front, this has created jobs for the community members to work as boatmen, guides, hospitality staff, shopkeepers etc. The inflow of tourists has also increased in the recent past. All this has led to an overall rise in standards of living and increased access to health and education services for the community.

The community conservation efforts of Mangalajodi have once again shown the significance of local communities in the sustainability and well-being of fragile ecosystems of our planet. It has shown that education, awareness, and willpower among the locals will go a long way in protecting our ecosystems such as Mangalajodi.



*A flock of black-winged godwits at the Mangalajodi Wetland*

## ENERGY-RELATED EMISSIONS BY BUILDINGS AND GLOBAL EFFORTS TO CURB THE EMISSIONS

By Rohan Sharma, AAO

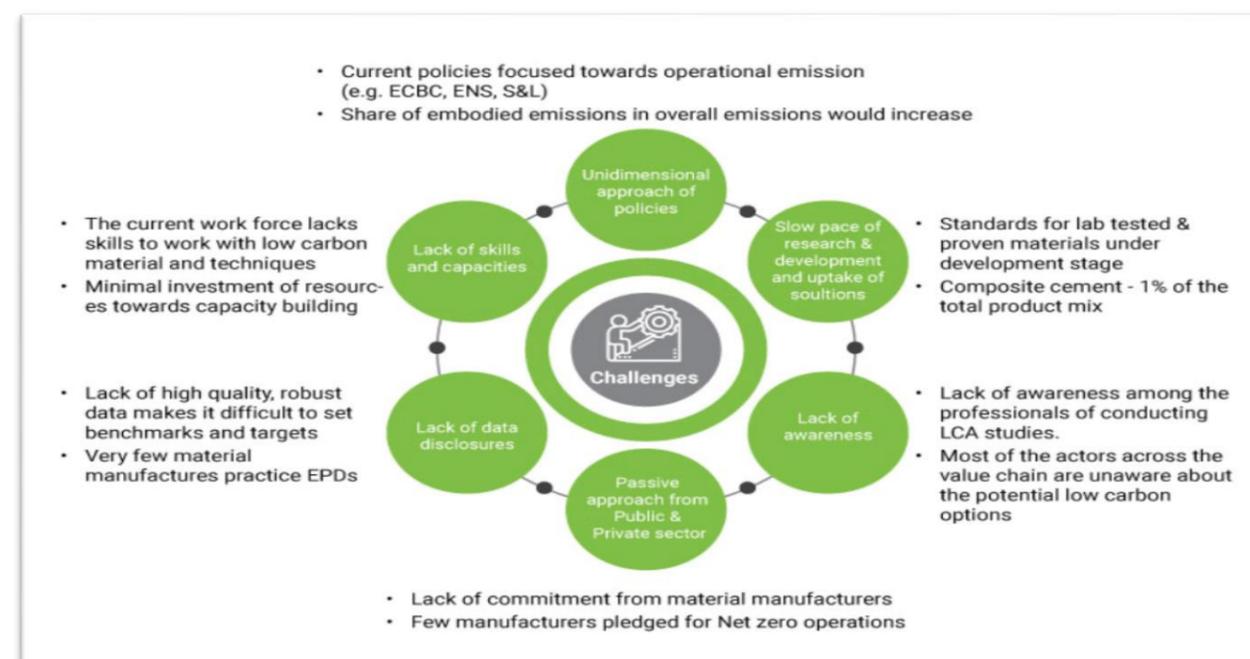
### Introduction

In the transition to a low-carbon, resilient, and sustainable society, buildings play a dominant role in the use of energy and are among the largest sources of energy-related Greenhouse gas (GHG) emissions. Today, buildings are responsible for almost 40 per cent of global energy-related carbon emissions, with homes alone accounting for nearly 20 per cent.

Property emissions are a combination of two things. The first is the day-to-day running of a building: energy used to light up, heat, or cool homes, office blocks and shopping malls. The carbon produced in this way is “operational”, in the vernacular, and accounts for 27 percent of all annual carbon emissions globally. The other type is “embodied” carbon, which refers to emissions tied to the building process, maintenance, and any demolition. Overall, embodied carbon is responsible for around 10 per cent of annual emissions. Embodied carbon is more difficult to measure and track than operational carbon, which is also the reason why it is more difficult to effectively regulate.

Emissions from the operation of buildings hit their highest-ever level in 2019, moving the sector further away from fulfilling its huge potential to slow climate change and contribute significantly to the goals of the Paris Agreement. As per the “Advancing Net Zero Status Report 2022” by World Green Building Council, the energy efficiency measures could reduce global emissions by 48 percent by 2030, with 43 percent of those coming from buildings. They can also support grid de-carbonization and significantly reduce costs while increasing resilience, durability, comfort, and productivity. As per the report, cement manufacturing is responsible for 7 percent of global carbon emissions and steel contributes a further 7-9 percent, with around half of these emissions attributed to buildings and construction. More than half of the total carbon emissions from new construction between 2020 and 2050 will be due to upfront emissions.

**Efforts taken by India** According to Global Alliance for Building and Construction estimates, India’s total building floor area would be around 57.6 Billion m<sup>2</sup> by 2050. This growth would also spur the demand for basic conventional construction materials like cement, steel, bricks, glass, etc. Studies suggest that demand for cement and steel (energy and emissions-intensive building materials) in India would reach up to 1,360 MT and 755 MT by 2050, from 328 MT and 99 MT in 2019, respectively. As per the data provided by India in the “[Third Biennial Update Report](#)” (BUR) (submitted on 20<sup>th</sup> Feb 2021) to UNFCCC, India has developed its building-energy rating system GRIHA (Green Rating for Integrated Habitat Assessment), based on 34 criteria such as site planning, conservation and efficient utilization of resources. As on October 2020, India has 1,825 GRIHA registered projects with approximately 52.5 million sq. meters of ‘green’ built-up area. India currently has about 7.61 billion sq. ft. green building footprint, 6,055 registered projects, and 780 certified projects (by Indian Green Building Council (IGBC)) only as on 15 October 2020.



*Key challenges that need to be addressed for the de-carbonization of this sector*

Understanding the barriers is the key to figuring out opportunities that would promote faster adoption of low-carbon interventions in the Indian building and construction sector. The figure above shows some key challenges that that need to be addressed for the de-carbonization of this sector.

India has been improving the energy efficiency of buildings through mandatory building energy codes and voluntary rating schemes, as well as through policies and programmes to improve the efficiency of appliances and equipment as follows:

1. National Building Code of India (NBC)-2016
2. Energy Conservation Building Code (ECBC)
3. Building Energy Efficiency Programme (BEEP); retrofitting project
4. Star rating system for existing commercial buildings
5. Eco Niwas Samhita for residential buildings

#### **Global efforts (market and policy measures): Abating GHG emissions caused by Construction and Building Sector**

Market leaders across the globe are working towards driving the efforts towards developing strategies for reducing the embodied carbon from the building and construction sector.

1. **Building Life:** Building Life is a European regional project led by the World Green Building Council and 10 green building councils across Europe. This project is building consensus on and steering the direction of the EU Policy Roadmap for whole life carbon as well as 10 national roadmaps and is the first region-wide response to the vision of a net zero embodied carbon built environment.
2. **US federal buildings - net zero energy strategy:** The United States has set a goal for zero energy in new construction by 2030 and for all buildings by 2050 (US General Services Administration [GSA] 2021).

The GSA is driving innovation for net zero design, green building certifications, green roofs, and advanced building technologies, creating a model for healthy and productive workplaces, a smaller environmental footprint and reduced costs in the building sector.

3. **Energy-efficient hotels - low-cost measures with great Impact:** Following awareness raising by the Programme for Energy Efficiency in Buildings, the Mexican hotel chain plans to build 20 new energy-efficient hotels, which will save an estimated 124 kilotons of Carbon Dioxide gas over a 30-year lifespan.

4. The Global Buildings Climate Tracker monitors the progress of the buildings and construction sector towards achieving the Paris Agreement. It is designed as an index comprising a range of indicators that are used to measure progress in Nationally Determined Contributions, certifications, building codes, the share of renewable energy in buildings, finance for energy efficiency in buildings, CO2 emissions and energy intensity. The Buildings Climate Tracker has also contributed to the **2020 Global Status Report for Buildings and Construction**, launched by the GlobalABC on December 16th 2020.

*A methodology has been released for tracking the de-carbonization action and impact of the buildings and construction sector globally – Developing the GlobalABC Building Climate Tracker*



## IMPORTANCE OF RAINFORESTS IN MITIGATING CLIMATE CHANGE

by Vikas Dhir, AAO

A rainforest is an area of tall, mostly evergreen trees and with a high amount of rainfall. Rainforest habitats are located around the tropics which is a zone around the equator. They are found near the cooler coastal areas further north or south of the equator. Rainforests are Earth's oldest living ecosystems, with some surviving in their present form for at least 70 million years. They are incredibly diverse and complex homes to more than half of the world's plant and animal species—even though they cover just 6 per cent of Earth's surface.

Scientists have shown that excess carbon dioxide in the atmosphere from human activities is contributing to Global Warming and Climate Change. But these rainforests help stabilize the world's climate by absorbing carbon dioxide from the atmosphere. Therefore, living rainforests have an important role in mitigating climate change as detailed in the below-mentioned points:

1. The rainforest is not only home to an incredible diversity of species, but it also has a critical cooling effect on the planet because its trees channel heat high into the atmosphere. Tropical forests can have a localized cooling effect by increasing humidity through transpiration and contributing to wind currents. Additionally, shade from the forest canopy can result in dramatically cooler temperatures relative to areas exposed to direct sunlight.

*Rainforests are the best defences of nature against climate change. Tropical rainforests are termed as “Lungs of the planet” because they draw in carbon dioxide and release oxygen. The Amazon in South America is the largest and most diverse tropical rainforest on earth. The Amazon rainforest absorbs one-fourth of the CO<sub>2</sub> absorbed by all the land on Earth. The amount absorbed today, however, is 30 per cent less than it was in the 1990s because of deforestation.*



Ariel view of Amazon Rainforest

Image source-By Jorge.kike.medina - Own work, CC BY 3.0, <https://commons.wikimedia.org/w/index.php?curid=7318072>

2. Rainforests add humidity to the atmosphere via transpiration (the process by which plants release water through their leaves), which in turn creates rain clouds. The moisture generated then returns to the land. Significant reductions in forest cover decrease rainfall and increase the incidence of drought.

3. Rainforests lessen the Earth's reflectivity because they absorb more heat than un-forested surfaces. When rainforests are cut down, the heat they have to absorb is reflected back into the atmosphere. This changes the local rainfall amounts and weather patterns, and over large enough areas, affects global weather patterns.

4. Rainforests sequester and store carbon. Forest ecosystems absorb roughly 2 billion tons of CO<sub>2</sub> each year, making them the largest terrestrial carbon sink on Earth. They capture, or sequester, carbon dioxide from the atmosphere and transform it into biomass through photosynthesis. Sequestered carbon is then stored in live trees, deadwood, litter and forest soils—contributing to the worldwide carbon “reservoir” that serves to mitigate climate change.

5. Forests are nature's water filters. Forests filter pollution and debris from runoff before it flows into larger bodies of water and water supplies. Forests also moderate the movement of rainwater so that it replenishes underground reserves.

7. These forests stabilize our Earth’s climate. Rainforests help maintain the delicate balance of local climate systems and stabilize the complex, natural processes that govern Earth’s climate.

8. Rainforests are being used as a source of food, wood, medicine and recreation for people. If forests are lost, people must find other places for these services and materials. These ecosystems provide much more than life-saving medicines and nourishing fruits.

### **Rainforest Depletion**

More than half of Earth’s rainforests have already been lost due to the excessive human demand for wood and arable land. Some of the main reasons for rainforest depletion are given below:

- Rapid increases in global population and urbanization and extreme tourist activities are the main causes of the depletion of rainforests.
- Logging interests cut down rainforest trees for timber used in flooring, furniture, and other items.
- Power plants and industrialization cut and burn trees to generate electricity.
- The paper industry turns huge tracts of rainforest trees into pulp.
- The cattle industry uses slash-and-burn techniques to clear ranch land.
- Agricultural interests, particularly the soy industry, clear forests for cropland.
- Subsistence farmers slash-and-burn rainforests for firewood and to make room for crops and grazing lands.
- Mining operations clear forests to build roads and dig mines.
- Governments and industries clear/cut forests to make way for service and transit roads.

### **Worrying climatic prospects for the Amazon Rainforest**

Climate change and deforestation could convert the majority of the Amazon rainforest into savanna, with massive impacts on the world’s biodiversity and climate.

- Guardian: Amazon could shrink by 85% due to climate change, scientists say
- NPR: A Drying Amazon Could Speed Climate Change

### **Conclusion**

According to researchers, the long-term health of tropical forests depend on their capacity to withstand multiple pressures from changing climate and deforestation. Global warming and rainforests are found the opposite of each other. Therefore, if climate change and global warming are to be kept under control, then it is mandatory for the humankind to protect the rainforests of this planet. Rainforests are very important resources which cannot be replaced. Stringent laws should be enforced to help in the preservation of rainforests. The destruction of rainforests will not only destroy our ecosystem but will also threaten the very existence of the human species.

## JOINT REPORT ON RESULTS OF THE INTERNATIONAL AUDIT ON WASTE MANAGEMENT AND UTILIZATION (2020)

by Anupam Srivastava Sr.AO

The coordinated audit on Waste Management and Utilization (2020) was conducted by the Supreme Audit Institutions (SAIs) of the Republic of Moldova, the Republic of Serbia and Ukraine. SAI Ukraine was the audit coordinator. The findings and conclusions of the cooperative audit report were based on individual National Audit Reports, which were compiled by the SAIs of the Republic of Moldova, the Republic of Serbia, and Ukraine. These National Audits were carried out in the field of household, industrial, and other hazardous waste management, which can pose a serious danger to human health and the environment, as well as lead to environmental and man-made disasters.

### Methodology

The methodology for conducting the audits was in accordance with INTOSAI International Auditing Standards (ISSAI) and Guidance (GUID), in particular ISSAI 100 «Fundamental Principles of Public-Sector Auditing», ISSAIs 300, 3000, GUID 3910, GUID 3920 on performance audits, GUID 9000 «Cooperative Audits between SAIs» and national audit standards and/or Guidelines of SAI-participants of the audit.



✓ **Relevance.** Inappropriate waste management poses a threat to the environment and human life and health. It is also the cause of environmental and man-made disasters, including fires and ecosystem pollution.

✓ **The key conclusion.** The waste management system today does not minimize potential threats to the environment and the population of countries, as well as could not prevent the occurrence of environmental and man-made disasters.

✓ **It was recommended** that governments should strengthen their efforts to move from the linear economy to a circular, based on maximum waste processing and the creation of an integrated waste management system in accordance with the EU's waste management hierarchy.

✓ **Expected Result.** Improving waste management, and, as a result - improving the public health, the protection of environment and disasters prevention.

*This audit facilitated the sharing of knowledge and experience between respective SAIs in order to achieve the overall objective of assisting national governments concerning further steps toward proper waste management. Inappropriate waste management poses a threat to the environment and human life and health. It is also the cause of environmental and man-made disasters, including fires and ecosystem pollution.*

### Joint Conclusions

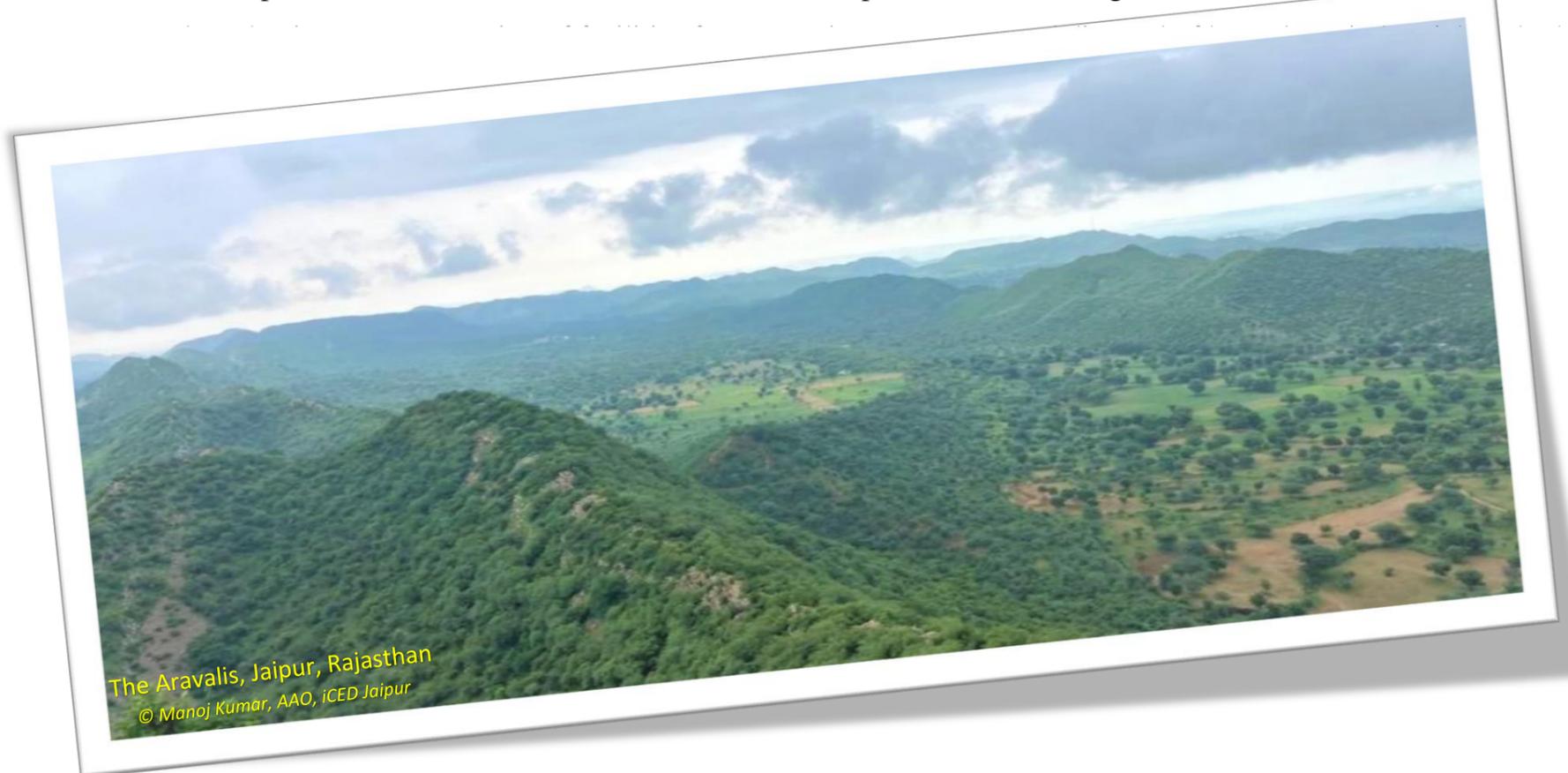
Some of the joint conclusions of the Audit Report are listed below:

1. It revealed that existing systems of environmental and technological safety of the population in these countries need to increase their effectiveness.
2. National regulations on waste management are incomplete and uncoordinated, including with international law and standards, in particular the European Union. Also, relevant national waste management strategies that affect the environment are not approved. There are also no methodologies for planning and implementing waste control.
3. The activities of authorities in the field of waste management are not sufficiently effective and coordinated, in particular, due to their significant amount. As a result, state environmental control is not effective enough, and therefore there are high risks of non-compliance by individuals and legal entities. The level of awareness and responsibility of these persons is also insufficient.
4. Due to untimely authorized bodies and officials' management decisions, part of the funds provided by the National Governments was not used and returned to the budget or was utilized for other purposes.
5. There are no corresponding international standards capacities for the processing, treatment, and disposal of hazardous industrial and other wastes in countries, which does not contribute to the creation of an integrated waste management system.
6. A significant part of waste (80–95 per cent), which is generated annually on the territories of the countries, remained at locations where the waste was produced or disposed of in landfills and rubbish dumps. Only a small part of the waste (3–10 per cent) was transferred to the procurement points of secondary raw materials for further treatment. The social tensions in society are also growing, as are the concerns of neighbouring countries over the transboundary movement of waste.

## Recommendations

The SAIs proposed to develop and take the following measures:

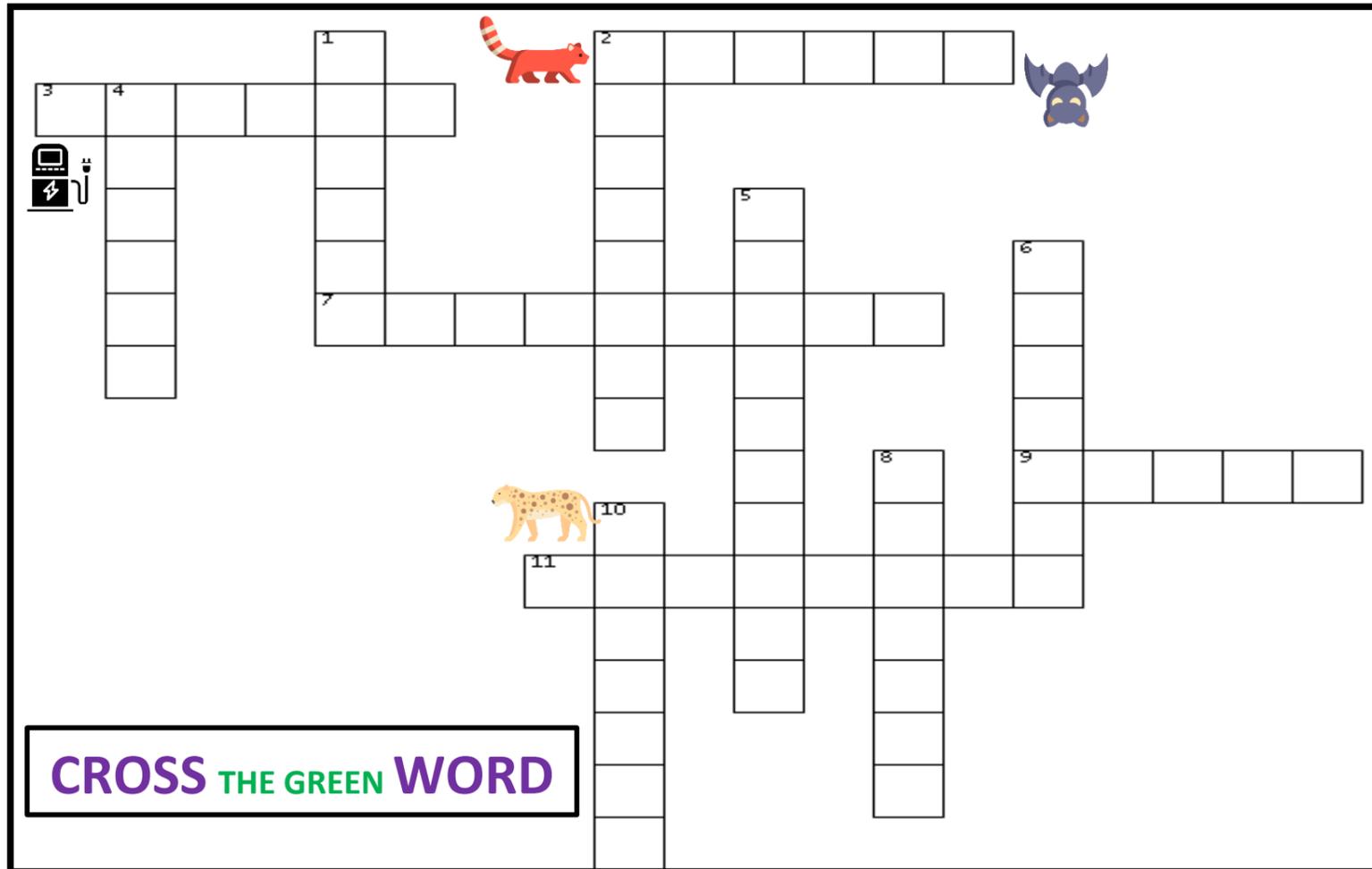
1. To strengthen coordination, interaction, and responsibility of state authorities in matters of waste management, as well as monitoring the effective implementation of its functions.
2. To alignment of national regulations in the field of waste management with the requirements of international law, in particular, certain Association Agreements with European Union countries.
3. To strengthen the role of state environmental control, including in the field of waste management.
4. To increase citizens' and entities' awareness of the requirements of waste management legislation. Increasing responsibility for non-compliance with this legislation by amending administrative and criminal law. Take into account the costs that must be incurred to eliminate the consequences of pollution and restore the environment when determining the losses caused to the environment by various types of waste.
5. To implement a system of extended producer responsibility: on the principle of "Polluter Pays".
6. To implement a packaging waste collection and return system, defining the financing arrangements for relevant activities, a list of obligations of packaging waste producers, requirements for packaging labelling and the use of eco-packaging. A ban on the use of disposable plastic tableware and limit the use of plastic packaging.
7. To implement the latest environmental and low-waste production technologies and economic mechanisms for stimulating business entities up to: reduction of harmful emissions



The Aravalis, Jaipur, Rajasthan  
© Manoj Kumar, AAO, ICED Jaipur

*“One of the first conditions of happiness is that the link between man and nature shall not be broken.”*

*Leo Tolstoy*



**CROSS THE GREEN WORD**

**ACROSS**

2. The country where the Hill's horseshoe bat has been discovered again after 40 years, having previously been considered extinct.

3. The city in which, India's first organic waste-powered Electric Vehicle (EV) charging station has been inaugurated.

7. The country which is planning to shift its capital city due to pollution and rise in sea-level.

9. A Memorandum of Understanding on "Biodiversity Conservation" was recently approved with this country.

11. The Khuvsgul Lake National Park recently added to the World Network of Biosphere Reserves by UNESCO is in this country.

**DOWN**

1. The French Polynesian island where a rare (and one of the largest in the world) rose coral reef has been discovered during a UNESCO ocean mapping expedition.

2. The Padmaja Naidu Himalayan Zoological Park recently launched a programme to introduce this endangered species in the Singalila National Park in Darjeeling District.

4. The Union Cabinet chaired by the Prime Minister Shri Narendra Modi, has approved India's updated Nationally Determined Contribution (NDC) to be communicated to this UN entity (An acronym).

5. The Indian state, was fined a compensation of Rs 3,500 crore by the National Green Tribunal (NGT) for failing to manage solid and liquid waste.

6. A campaign launched to promote the use of EVs for ride-hailing and delivery services and minimise air pollution.

8. An application jointly developed by union ministries of Panchayat and Rural Development to measure the water level in a well twice a year before and after monsoon.

10. The African country from which Cheetahs have been brought in Kuno National Park (KNP) in Madhya Pradesh.

Across- 2.Rwanda, 3.Mumbai, 7.Indonesia, 9.Nepal, 11.Mangolia  
 Down- 1.Tahiti, 2.Red Panda, 4.UNFCCC, 5.West Bengal, 6.Shoonya, 8.Jaldoot, 10.Namibia

# 76<sup>TH</sup> INDEPENDENCE DAY IN ICED CAMPUS

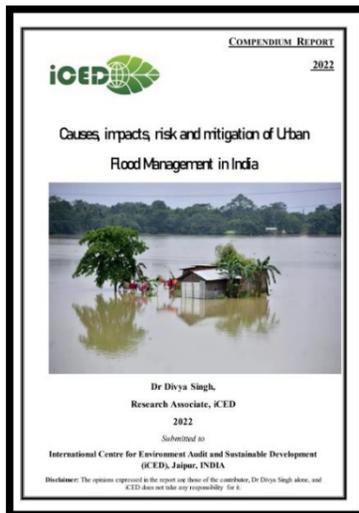
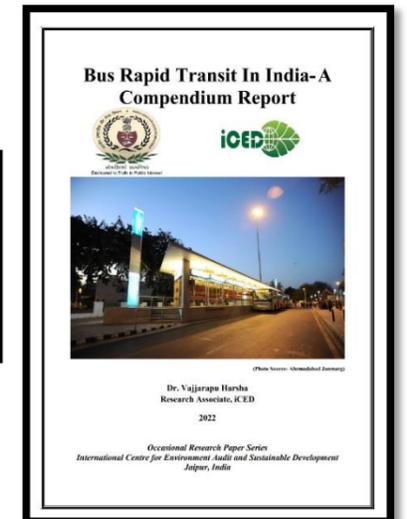


## Research Articles From iCED Research

### iCED's Occasional Research Paper Series

Occasional Research Paper on “Bus Rapid Transit In India-A Compendium Report” by Dr. Vajjarapu Harsha Research Associate

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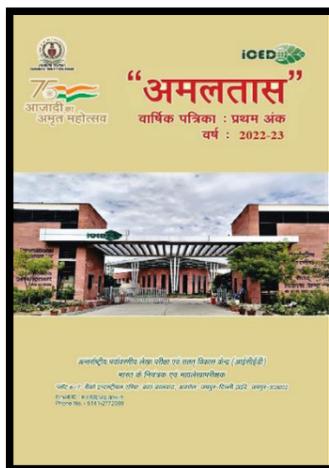
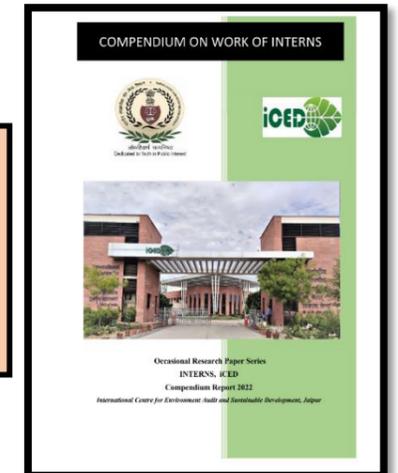
Occasional Research Paper on "Causes; impacts; risk and mitigation of Urban Flood Management in India” by Dr. Divya Singh Research Associate, iCED

The Paper can be accessed through this [link- https://online.fliphtml5.com/dnddh/ucmp/#p=1](https://online.fliphtml5.com/dnddh/ucmp/#p=1)

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A “Compendium on works of interns- Compendium Report 2022” by Research Section, iCED

The Paper can be accessed through this [link- https://fliphtml5.com/dnddh/bmlr/](https://fliphtml5.com/dnddh/bmlr/)



Annual Hindi Magazine (First Edition) “AMALTAS” is uploaded on iCED’s website.

The Magazine can be accessed through this [link- https://online.fliphtml5.com/dnddh/hqqd/#p=1](https://online.fliphtml5.com/dnddh/hqqd/#p=1)

## iCED's Contribution to ASOSAI Journals



### **ASOSAI Journal April 2022 Edition**

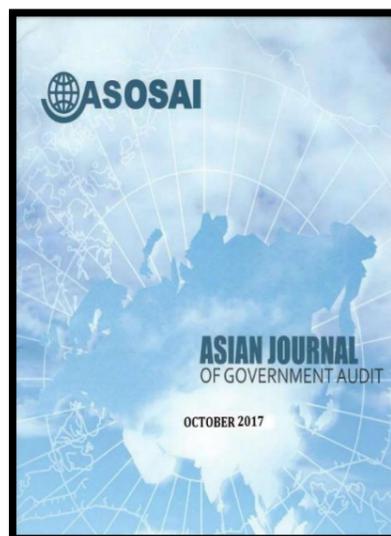
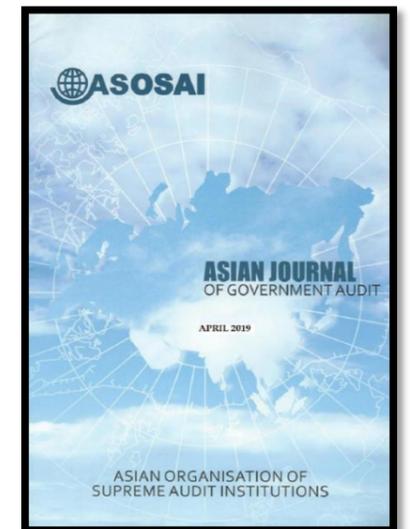
Article on “Auditing Climate Change- An Overview and Experience from SAI India” by Team at International Centre for Environment Audit and Sustainable Development (iCED), Jaipur - SAI India

The article can be accessed through this [link- https://asosaijournal.org/wp-content/themes/educavo/assets/images/April-2022.pdf](https://asosaijournal.org/wp-content/themes/educavo/assets/images/April-2022.pdf)

### **ASOSAI Journal April 2019 Edition**

Article on “Role of SAIs in Detecting Fraud and Corruption” by Shri Pushkar Kumar, Director (Training & Research),iCED

The article can be accessed through this [link- https://www.sayistay.gov.tr/files/1214\\_ASOSAI\\_Journal\\_April\\_2019.pdf](https://www.sayistay.gov.tr/files/1214_ASOSAI_Journal_April_2019.pdf)



### **ASOSAI Journal October 2017 Edition**

Article on “Role of SAIs in implementation of Sustainable Development Goals” by Shri Sunil Dadhe and Shri J.R. Inamdar, SAI India

The article can be accessed through this [link- https://asosaijournal.org/wp-content/uploads/2021/08/October-2017.pdf](https://asosaijournal.org/wp-content/uploads/2021/08/October-2017.pdf)

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### Importance of Rainforests in mitigating Climate Change

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### Biodiversity in iCED, Jaipur

[https://en.wikipedia.org/wiki/Asian\\_green\\_bee-eater](https://en.wikipedia.org/wiki/Asian_green_bee-eater)

Picture © Suman Dutta, AAO, O/o Director General of Audit (Central), Kolkata

## Biodiversity in iCED, Jaipur



© Suman Dutta, AAO, O/o Director  
General of Audit (Central), Kolkata

### Asian Green Bee Eater

#### Conservation status



[Least Concern \(IUCN 3.1\)](#)

#### Scientific classification

Kingdom:	<a href="#">Animalia</a>
Phylum:	<a href="#">Chordata</a>
Class:	<a href="#">Aves</a>
Order:	<a href="#">Coraciiformes</a>
Family:	<a href="#">Meropidae</a>
Genus:	<a href="#">Merops</a>
Species:	<b><i>M. orientalis</i></b>

The Asian green bee-eater (*Merops orientalis*), also known as little green bee-eater, is a near passerine bird in the bee-eater family. It is resident but prone to seasonal movements and is found widely distributed across Asia from coastal southern Iran east through the Indian subcontinent to Vietnam. They are mainly insect eaters and they are found in grassland, thin scrub and forest often quite far from water.

This species is a richly coloured, slender bird. It is about 9 inches (16–18 cm) long with about 2 inches made up by the elongated central tail-feathers. The entire plumage is bright green and tinged with blue especially on the chin and throat. The crown and upper back are tinged with golden rufous. The wings are green and the beak is black. The elongated tail feathers are absent in juveniles. Bee-eaters predominantly eat insects, especially bees, wasps and ants, which are caught in the air by sorties from an open perch.

A study has suggested that green bee-eaters may be capable of interpreting the behaviour of human observers. They showed an ability to predict whether a human at a particular location would be capable of spotting the nest entrance and then behaved appropriately to avoid giving away the nest location. The ability to look at a situation from another's point of view was previously believed to be possessed only by primates.