

# Green Files

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INTERNATIONAL CENTRE FOR ENVIRONMENT  
AUDIT AND SUSTAINABLE DEVELOPMENT  
JAIPUR



GREEN FILES

*Newsletter on Environment Audit and Sustainable Development issues*  
**International Centre for Environment Audit and Sustainable  
Development (iCED)**

**EDITORIAL**

Green Files, a quarterly newsletter published by iCED features glimpses of the recent environment news, persons and environment projects in focus. Emerging trends in innovation, initiatives and efforts of different environment organizations to protect the environment also find occasional reflection in this newsletter. Court judgements on environment issues as well as recent national and international audit reports on environment and sustainable development, are also included in this issue for knowledge sharing among the auditors.

During the quarter January-March 2018, iCED organized an International Workshop on Audit of Water issues, with an objective to provide a platform to various SAIs for contributing and sharing their valuable knowledge and experience in the field of 'Audit of Water Issues'. This Workshop was aimed at interaction on issues relating to water pollution, integrity and accountability in water sector, water scarcity and resource management, water and climate change, drinking water and sanitation, etc. stalwarts in water sector visited iCED on this occasion.

iCED also hosted a meeting of 'Learning Taskforce' of INTOSAI Working Group on Extractive Industries which deliberated to identify the capacity gaps of SAIs in Extractive Industries' Audit; develop detailed learning programme / plan on gaps identified and came up with a tentative extractive industry audit curriculum.

Mr. Teruhiko Kawato, President of Board of Audit, Japan visited iCED on 10 January 2018. A six member delegation from SAI Maldives also visited iCED, from 14 – 16 March 2018.

During the quarter iCED also conducted National Training Programmes on 'Audit from Gender Perspectives', 'Natural Resource Accounting', 'Management of Rivers and River Basins' and 'Audit of Environmental Issues in Coal India Limited. This newsletter also features an interesting article on the State of Meghalaya. I note with gratitude two articles featured in this newsletter. An article on 'Glass facade' by Mr. Mukesh Kumar Lal is also featured in this newsletter. This article thinks aloud "Green concerns" regarding modern buildings. In another article Ms. Sosephina Susan recounts her experiences during fifth international training programme on Introduction to Environment Audit.

I hope readers find these of interest and use. We at iCED, also look forward to your suggestions to make Green Files more useful and appealing. Contributions in any form within the broad scope of the newsletter are encouraged. These can be mailed to [iced@cag.gov.in](mailto:iced@cag.gov.in)

With regards,

**Sunil Dadhe**  
**Director General, iCED**

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## I. iCED News

During the quarter January to March 2018, iCED organized one International Workshop and four National Training Programmes. iCED also facilitated one National Workshop and a Meeting of INTOSAI WGEI Taskforce. International Workshop on Audit of Water issues was conducted from 19 to 23 February 2018, with an objective to provide a platform to various SAIs for contributing and sharing their valuable knowledge and experience in the field of 'Audit of Water Issues'. This International Workshop for Audit Managers of SAIs aimed at interaction on issues relating to water pollution, integrity and accountability in water sector, water scarcity and resource management, water and climate change, drinking water and sanitation, etc. Workshop was attended by 12 participants from 8 countries across the globe viz. Bhutan, Egypt, India, Lao PDR, Malaysia, Sudan, Thailand and Zambia.

Eminent experts in the field of water related issues delivered sessions during the workshop but the emphasis of the workshop was more on sharing experience of audit of water issues and discussion on strategic issues. Three themes were identified for experience sharing and discussion:

- Water Pollution
  - Water Scarcity and Resource Management
  - Drinking water and sanitation
- A field visit to Tarun Bharat Sangh (TBS), a non-



*Participants with Dr. Rajendra Singh at TBS*

governmental organization located at Kishori-Bhikampura in Alwar district of Rajasthan was organized for the participants so as to illustrate practice of sustainable development through low cost and simple water conservation measures created and managed by local rural community. Dr. Rajendra Singh founder of Tarun Bharat Sangh (TBS) and winner of 'Ramon Magsaysay Award for community leadership in 2001' and 'Stockholm Water Prize', also known as the Nobel Prize for water in 2015, briefed the participants about community based water conservation measures undertaken by TBS and their socio-economic impact including improvement of agriculture, economy in rural areas; reversal of out-migration of youth for employment opportunities; improvement in condition of woman and woman empowerment; etc.

iCED hosted first meeting of INTOSAI WGEI Taskforce from 22 to 27 January, 2018, to



*INTOSAI WGEI Taskforce members with DG, iCED*

identify the capacity gaps of SAIs in Extractive Industries Audit; develop detailed learning programme / plan on gaps identified in Extractive Industries; and come up with extractive industry curriculum. Mr. Maxwell Poul Ogentho, INTOSAI WGEI Secretariat; Mr. Edward Ssali, INTOSAI WGEI Community of Practice (CoP); Mr. Edmond Shoko, AFROSAI-E; Mr. Zakaria Abukari, SAI Ghana; Mr. Anthony Sunday Peter Kimuli, SAI Uganda; Ms. Grace Lushinga Chanda, SAI Zambia; and Mr. Jahangir Inamdar, SAI India participated in the meeting. Following the meeting the Task Force came up with a 'Draft Training Curriculum for Extractive Industries'.

Mr. Teruhiko Kawato, President of Board of Audit, Japan along with his secretary Mr. Masaaki Koike and Mr. Masaaki Tanino,

official from Board of Audit, Japan visited iCED, Jaipur on 10 January, 2018. A six member delegation headed by Assistant Auditor General, SAI Maldives also visited iCED, Jaipur from 14 – 16 March, 2018.

Based on request received from the Office of Principal Director Commercial Audit and Member Audit Board – II, Kolkata, West Bengal, iCED conducted a 4 day National Training Programme on ‘Audit of Environmental Issues in Coal India Limited’ from 22 to 25 January 2018. A total of 19 participants including one IA&AS officer from Office of Principal Director Commercial Audit and Member Audit Board – II, Kolkata participated in the training programme. Participants learnt important aspects of National Environment Policy, particularly with reference to mining/coal mining; impacts of mining/coal mining on environment; different facilities/technologies to coal mining companies for mitigation of environmental impact of coal mining; best practices followed in other countries for mitigation of environmental impact of coal mining. The



*Participants of NTP on Audit of Environmental Issues in CIL with Director General, iCED*

participants had a grasp of role discharged by Ministry of Environment and Forest (MoEF), Central Pollution Control Board, State Pollution Control Board and other organizations and regulatory bodies in India for monitoring and analysis of impact of environmental degradation and remedial measures to overcome impact of coal mining. The participants audit also gained

understanding of issues for Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) of a mining company and various issues to be seen by audit during Environment Audit of coal mining companies.

iCED also conducted following NTPs during the quarter:

- i. NTP on ‘Audit from Gender Perspectives’ from 29 January to 02 February, 2018;
- ii. NTP on ‘Natural Resource Accounting’ from 05 February to 09 February, 2018; and
- iii. NTP on ‘Management of Rivers and River Basins’ from 05 March to 09 March, 2018.

iCED hosted Workshop for All India Performance Audit on ‘Ground Water Management and Regulation Scheme’ from 26 to 27 February 2018. A total of 68 participants including 29 IA&AS officers participated in the workshop. Experts from Central Ground Water Board (CGWB) and WAPCOS Limited also participated in the workshop. Shri P.K Dhamija, Statistical Advisor, Office of the C&AG of India, New Delhi was also invited to the workshop to provide inputs on sampling. Dr. A.K. Sinha, Professor, Manipal University, Jaipur delivered presentation on Groundwater challenge.

➤ **Vijendra Tanwar**

## II. ASOSAI NEWS- Improvement and Innovation of Audit Process

An ASOSAI Knowledge Sharing Seminar on “Improvement and Innovation of Audit Process - Including Audit on Preparedness for Implementation of Sustainable Development Goals (SDGs)” was held in Kuwait City, Kuwait from December 10 to 14, 2017 with the administrative support of State Audit Bureau of Kuwait. Thirty two participants from thirty member SAIs attended the seminar with facilitation and technical guidance provided by

Subject Matter Experts (SMEs) from SAI India and SAI Kuwait.

The purpose of the seminar was to discuss and identify best practices and recommendations of Improvement and Innovation of Audit Process. The seminar addressed the following sub themes:

- a. Improvement and Innovation of Audit Planning
- b. Improvement and Innovation in conducting Audit
- c. Improvement and Innovation in Reporting; and
- d. Improvement and Innovation of Follow-up

The seminar also aimed at sharing experience of audit on preparedness for implementation of SDGs and discussing issues and challenges, where a guest speaker from European Court of Auditors and some selected participating SAIs made presentations to share ideas and experiences. The participants jointly formulated best practice and recommendation of Improvement and Innovation of Audit Process.

[http://www.asosai.org/asosai/activities/seminar\\_detail.jsp?idx=11312](http://www.asosai.org/asosai/activities/seminar_detail.jsp?idx=11312)

➤ Pankaj Saini

### III. State in Focus: Meghalaya

The State of Meghalaya is situated in the north east of India with Shillong as its capital. Emergence of Meghalaya as an Autonomous State on 2nd April 1970 and as a full-fledged State on 21st January 1972 marked the beginning of a new era of the geo-political history of North Eastern India. Nature has blessed this state with abundant rainfall, sunshine, virgin forests, high plateaus, tumbling waterfalls, crystal clear rivers, meandering streamlets and above all with sturdy, intelligent and hospitable people.

Meghalaya is the homeland mainly of the Khasis, the Jaintias and the Garos. The Garos inhabit western Meghalaya, the Khasis in central Meghalaya, and the Jaintias in eastern

Meghalaya. The Khasi, Jaintia, Bhoi, War, collectively known as the Hynniewtrep people predominantly inhabit the districts East of Meghalaya, also known to be one of the earliest ethnic group of settlers in the Indian sub-continent, belonging to the Proto Austroloid Monkhmer race. The Garo Hills is predominantly inhabited by the Garos, belonging to the Bodo family of the Tibeto-Burman race, said to have migrated from Tibet.

Meghalaya is subject to vagaries of the monsoon. The climate varies with altitude. The climate of Khasi and Jaintia Hills is uniquely pleasant and bracing. It is neither too warm in summer nor too cold in winter, but over the plains of Garo Hills, the climate is warm and humid, except in winter. The Meghalayan sky seldom remains free of clouds. The average annual rainfall is about 2600 mm over western Meghalaya, between 2500 to 3000 mm over northern Meghalaya and about 4000 mm over south-eastern Meghalaya. There is a great variation of rainfall over central and southern Meghalaya. At Sohra (Cherrapunjee), the average annual rainfall is as high as 12000 millimetres, but Shillong located at a distance of about fifty kilometres from Sohra receives an average of 2200 mm of rainfall annually.

Meghalaya is basically an Agricultural State with about 80% of its total population depending entirely on Agriculture for their livelihood. Meghalaya with its wealth of mineral deposits has tremendous industrial potential. There are extensive deposits of coal, limestone, granite, clay and other minerals. Beside these, other economically viable minerals like gypsum, phosphorite, glass-sand, base metals, quartz and feldspar can be located in various parts of the state. The State is also credited with having one of the most valuable sillimanite deposits in the world.

Meghalaya is one of the few states in the country with surplus power generation. The state possesses a hydro-electricity potential of nearly 1,200 MW. The State is a major beneficiary of the South West Monsoon. The average annual rainfall is 11,000 mm. All the rivers are monsoon fed.

Source:

<http://meghalaya.gov.in/megportal/stateprofile>

## Environment Scenario

### (a) Forests

As per Government of India's Forest Survey Report 2015, total recorded forest area in the state is 9496 sq. km. (Reserved forest-1113 sq. km., protected forest - 12 sq. km. and unclassed forest- 8371 sq. km.); thus constituting 42.34% of the geographical area of the state and 1.24% of India's forest area.

The forests of Meghalaya can be broadly classified into the following types:

1. Alluvial Sal - This type conforms to type North Indian Tropical Moist Deciduous Kamrup Alluvial Sal Forests
2. Foothill and Plateau Sal - This type conforms to the type North India Tropical Moist Deciduous Eastern Hill Sal Forests
3. Very Moist Sal Bearing Forests - Khasi Hills Sal
4. Mixed Deciduous Forests - North India Tropical Moist Deciduous (East Himalayan Moist Deciduous Forests. *This is major type of forest of the state, covering more than 50 per cent forest area of the state.*)
5. Evergreen Forests - These forests conform to the type Northern Tropical Semi-Evergreen Forests
6. Bamboo Forests - This type conforms to the type Northern Tropical Semi-Evergreen Forests
7. Grasslands - Northern Tropical Moist Deciduous Forests - Low Alluvial Savannah Woodland
8. Assam Sub-Tropical Pine Forests

Main reason for decrease in forest cover is shifting cultivation and other biotic pressure etc.

Source: <http://fsi.nic.in/isfr-2015/isfr-2015-forest-and-tree-resources-in-states-and-union-territories.pdf>;

<http://www.megforest.gov.in/>

### (b) Biodiversity

The state is situated in NE India Bio-geographic zone (along with Assam, Nagaland, Manipur, Mizoram and Tripura) which is a significant region as it represents a transition zone between the Indian, Indian-Malayan, Indo-Chinese bio-geographic regions as well as a meeting place of Himalayan mountains with the peninsular India. The region is one of the richest in biological values with vegetation types ranging from tropical rain forest in the foothills to Alpine meadows and cold deserts.

The state also represents an important part of the Indo-Burman biodiversity hotspot which is one of the 4 present in India and 34 in the World. The state has been identified as a key area for biodiversity conservation due to its high species diversity and high level of endemism.

### Floral Diversity:

The presence of a large number of primitive flowering plants has prompted famous botanist Takhtajan to call it the 'Cradle of Flowering Plants'. State harbours about 3128 species of flowering plants and contributes about 18% of the total flora of the country, including 1237 endemic species. A wide variety of wild cultivable plants, edible fruits, leafy vegetables and orchids are found in the forests. However, due to overexploitation, deforestation and habitat destruction many endemic and threatened species are now mainly confined to the protected areas and sacred groves.

Recently, State Biodiversity Board revealed that a total of 426 Rare, Endangered and Threatened plants species were recorded from Meghalaya representing 13.09% of the state's flora.

The state is endowed with a rich and luxuriant orchid flora of nearly 352 species belonging to 98 genera representing 27.08% of the country's orchid flora. It also harbours more than 37 species of Bamboos belonging to 14 genera. Of

the total 3331 plant species recorded in the state around 834 (25.04%) are estimated to be employed in healthcare.

### **Faunal Diversity:**

Faunal diversity of state include mammals (139 species), Aves (540 species), Reptiles (94 species), Amphibians (33 species) and Pisces (152 species) under vertebrates and 4580 species under Invertebrate.

The primates are well represented in Meghalaya with about 7 species viz: The Western Hoolock Gibbon-*Endangered species*; The Bengal Slow Loris *Nycticebus bengalensis-Vulnerable*; the Capped Langur *Trachypithecus pileatus*, Northern tailed macaque *Macaca leonine*; Rhesus macaque *Macaca mulatta*; Assamese macaque *Macaca assamensis* and Stumped tail macaque *Macaca arctoides*. Last one is the rarest but is still seen in Narpuh, Norkek and Balpakram areas.

The state has three of the six largest cats in the world: Tiger, Leopard and the clouded Leopard (State animal). Tiger has become a very rare animal in the state.

The protected area network includes two National Parks, four WILDLIFE Sanctuaries and one Biosphere Reserve playing an important role in in-situ conservation of biodiversity. Nokrek Ridge National Park is the core of the Nokrek Biosphere Reserve covers an area of 47.48 sq km with 227.92 sq km buffer zone and 544.60 sq km transition zone.

Source:

<http://megbiodiversity.nic.in/floral-biodiversity.html> ;  
<http://megbiodiversity.nic.in/faunal-biodiversity.html>

### **(c) Wetlands**

Major wetland types observed in the state are rivers, reservoirs and few lakes, Umiam lake, Nongkhnum Island and Ranikor riverine area are important wetland sites of Meghalaya.

The geological formations, its resultant topography and tendency of headword erosion

by rain water have lead to the creation of drainage network in Meghalaya. The state is blessed with number of perennial rivers. The principal rivers of the state run either a Northerly or Southerly direction. The rivers flowing towards the north to meet mighty Brahmaputra river of Assam plain have gentle gradient of longitudinal profiles and thereby do not form any major waterfalls and deep gorges. The rivers flowing towards the south are characterized by steepest gradient and abruptly fall to the Bangladesh plain.

The major rivers of the state are Ganol, Ringgi, Krishnai, Manda, Darong, Bhogai, simsang, Dareng, Umkhri, Umtrew, Umiam, Kopili, Kynshiang, Shella, Umngot, Myntdu, Lubha, etc. One of the marked features of River Kynshi in West Khasi Hills is the formation of River Island called Nongkhnum. Nongkhnum is not only India's but Asia's second largest river island. Ranikor situated in the West Khasi Hills district in the confluence of Kynshi and Rilang rivers is one of the best fishing spots. Meghalaya has the highest hydro – electric potential in the north-eastern region second only to Auranachal Pradesh. Hydel projects such as Umiam and Umtrew have caused construction of artificial lakes for the generation of electricity. Umiam Lake commonly called Barapani is formed by the damming of the Umiam river under the Umiam Hydro-Electric Project is a place of major tourist attraction and has great potentialities of recreation, aquatic sports, fishing etc. Meghalaya is also noted for a number of river cataracts and waterfall of great beauty located at different heights and scenic setting.

Source:

[http://www.moef.nic.in/sites/default/files/NWI\\_A\\_Meghalaya\\_Atlas.pdf](http://www.moef.nic.in/sites/default/files/NWI_A_Meghalaya_Atlas.pdf)

### **Water availability:**

The state is besotted with numerous problems when it concerns water. There are, however, two main ones. In winter and dry season, there is shortage of water. People are forced to buy the essential commodity. Water carriers are a common sight on the streets of Shillong and its suburbs. And the deficiency is spreading to

other towns and urban centres. If such is the scenario at present one can simply conjectures what will happen in the near future!

During summer or rainy season, just when one thinks there is enough water, if not excess, people have to worry about water pollution. This type of pollution has become a major threat to the survival of all types of creatures. Dangerous diseases which have claimed a lot of human lives like typhoid, jaundice, cholera, dysentery and hepatitis are the outcomes of water pollution. Foul water infects food which in turn is responsible for infectious diseases.

### **Water quality:**

Meghalaya State Pollution Control Board (MSPCB) reported that over the last few decades or so, state has started facing 'serious problems' of surface and groundwater pollution due to indiscriminate discharge of untreated municipal effluents, industries, agricultural runoff, the latest report issued by the said.

It was also reported that in order to obtain information regarding the overall health and general environmental state of the rivers and ground-water resources in the state, the MSPCB has been monitoring the water quality in selected water bodies under the National Water Monitoring Programme on a regular basis.

"The monitoring covers 20 rivers/streams, four lakes and seven springs/wells. A total of 54 sampling locations (47 of surface water and seven of groundwater) are being monitored on a regular basis," adding that the monitoring of water quality is a step towards control of water pollution as indicated in the Water (Prevention and Control of Pollution) Act, 1974.

### ***Case study by independent reporter:***

According to reports the Meghalaya State Pollution Control Board conducted surveys and pointed out that the pollution of the Lukha river was due to the extraction of coal. But when coal extraction has been banned by the NGT the river still turns blue which goes contrary to the findings of the MSPCB. Therefore, the cause

for pollution of the river may be from the toxic chemicals emission from the Cement Plants from Lumchong and other catchment areas of Lukha river, which the (MSPCB) may have discreetly left out.

Source:

<https://thenortheasttoday.com/meghalaya-surface-and-groundwater-pollution-cause-serious-concern/>  
<http://meghalayatimes.info/index.php/cfm/16417-water-pollution;>  
<http://www.theshillongtimes.com/2017/02/09/pollution-of-lukha-river>

### **(d) Municipal Solid Waste management**

Solid Waste Management is one of the essential obligatory functions of the Urban Local Bodies in India. Municipal solid waste and its management is a big concern for India these days.

As a result of the rapid growth of the urban population coupled with the changing lifestyles of the people, the Municipal Solid Waste generated daily has increased. If this Solid Waste issue is ignored for long, it will have serious ramifications on the health and hygiene of the public along with associated environmental risk. Therefore, there is an urgent requirement to have a systematic and scientific plan to tackle this issue.

Local bodies of Meghalaya:

- [Jaintia Hills Autonomous District Council, Meghalaya](#)
- [Shillong Municipal Board, Meghalaya](#)

As per 2011 census, Urban population of state is 5.95 lakh (20.07%). Shillong Municipal Board (SMB) is responsible for management of solid wastes within the municipal boundaries of Shillong (10.26 sq. km) comprising 27 wards. The municipal area is subdivided into 5. The Cantonment board manages the Cantonment. Outside the SMB and Cantonment area within the GSPA, the Autonomous District Councils (ADC) and the Dorbar Shnongs play an important role in provision of civic services and in development works.

As per the baseline survey conducted by NEHU, SWM in the city as a whole is dominated by collection vehicles. 72% of household surveyed are getting benefit of the collection vehicles and around 12% simply burn the waste generated by them. Throwing of waste in open space is continued by over 2%. A little less than 9% households simply throw their waste into waste bins located in the neighborhood not necessary collected by collection vehicles.

Door to door collection of waste is practiced by small section accounting for only 5%. The SWM improvement works has been taken up under the NERCCDIP project to meet the gaps. A separate DPR has been prepared for the proposed SWM improvement works.

**Management Strategy:** The capital town of Meghalaya, Shillong has been experiencing rapid urbanization and most of the urban development has taken place within the Shillong Urban Agglomeration. Increasing population combined with limited public land available for setting up infrastructure has resulted in congestion and created a strain on the existing urban services present. This has been accompanied by a deterioration in the cleanliness of Shillong and it has been a common sight to see littering occurring in the city. Open dumping of waste onto public roads and into streams has contributed to increasing pollution and increased health hazards.

The issue of waste management in the Shillong Urban Agglomeration is currently being handled by multiple public agencies and include the traditional local institutions. The agencies involved have been working in an isolated manner within their respective jurisdictions and in light of the current scenario, a coordinated effort needs to be established to better handle the waste management in Shillong. Moreover, the Court has also intervened on this issue and has ordered the State Government to constitute a Supervisory Committee that is to be headed by the Chief Secretary and to include members from all stakeholders, to actively monitor, improve and

maintain the cleanliness in Shillong. Since the Supervisory Committee has been constituted, efforts have been initiated to bring about this objective with the coordinated efforts being streamlined through an Action Plan/Performance Outcome Indicators.

The online portal for the Supervisory Committee is being created to enable the citizens of Shillong to actively participate in the process of cleaning up the city. Complaints can be made on the online portal with prompt and necessary action to be taken by the agency concerned.

**Source:**

<http://cleanshillong.nic.in/waste-management.html>;

<https://www.census2011.co.in/census/state/meghalaya.html>

**(e) Air Pollution**

Growing air pollution has emerged as a serious concern in the cities, with vehicular emission and dust contributing a major share of the deteriorating air quality. To prevent, control and abate air pollution in the country, the Government of India enacted Central legislation called the Air (Prevention & Control of Pollution) Act, 1981 (referred to as the Air Act, 1981). Every polluting industry must obtain a consent from the State Pollution Control Board for the discharge of air pollutants in any form through chimney or otherwise. The State Board may lay down suitable conditions while giving consent to discharge air pollutants in the light of emission standards developed by the Central Board, subsequently notified through the rules framed under the Environment (protection) Act, 1986 Rules.

Central Pollution Control Board initiated National Ambient Air Quality Monitoring (NAAQM) programme in the year 1984 with only seven monitoring stations in the country. Now, there are 683 operating stations in 264 cities/towns in 29 states and 5 Union Territories of the country. Details of operating stations in state are under:

City	Nos. of stations
Shillong	4
Dwaki	1
Ri-Bhoi, Brynihat	1
Tura	1
Nongstoin	1
Umaim	1
Khlihriat	1

Ambient Air Quality Status:

As per Air quality index data of July 2017, AQI of Shillong city was in range of good to satisfactory.

Source: <http://cpcb.nic.in/monitoring-network-3/>  
<http://cpcb.nic.in/displaypdf.php?id=bWFudWFsLW1vbml0b3JpbmVvQVFJX05BTVBfUmVwX0p1bHkyMDE3LnBkZg>

➤ *Virendra Jakhar*

#### IV. Environmental News

##### 1. "Swachh Bharat Sanitation Park" inaugurated in Delhi

The Ministry of Drinking Water and Sanitation, in collaboration with the Environmental Sanitation Institute and Tata Trusts, has developed a Sanitation Park. The Sanitation Park has been developed at CGO Complex in New Delhi with an objective to create awareness on various safe technological options. The Park demonstrates various options pertaining to toilet technologies and solid and liquid waste management technologies, with a brief description of these technologies.

The Park also displays information regarding various interventions undertaken under the Swachh Bharat Mission, capturing the success stories and impact created under the Mission across the country.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176450>

##### 2. Swachh Shakti 2018: 15000 women Swachh Bharat champions to gather in Lucknow on International Women's Day

The Ministry of Drinking Water and Sanitation, in association with the Government of Uttar Pradesh, organized a Women's Convention – called Swachh Shakti 2018 –March, on International Women's Day, at Lucknow. 8000 women *Sarpanchs*, 3000 women *Swachhagrahis*, 2000 *Mahilasamakhys* from Uttar Pradesh and women *Sarpanchs* from across the country participated to present their outstanding contribution towards making Swachh Bharat a reality in rural India. Last year, 6000 women *Sarpanchs* from across the country had assembled in Gujarat on the occasion of International Women's Day under the banner Swachh Shakti 2017.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=177138>

##### 3. High Performance Computing (HPC) facility at Noida

The High Performance Computer (HPC) System named 'Mihir' (meaning 'Sun') was dedicated to the nation at the National Centre for Medium Range Weather Forecasting (NCMRWF) at Noida. It will be India's largest HPC facility in terms of peak capacity and performance and will propel India's ranking from the 368<sup>th</sup> position to around the top 30 in the Top 500 list of HPC facilities in the world. India will now also be ranked 4<sup>th</sup>, after Japan, UK and USA for dedicated HPC resources for weather / climate community.

The new HPC facility is expected to improve the following services:

- Weather forecasts at block level over India which can predict extreme weather events.
- High resolution seasonal / extended range forecasts of active / break spells of Monsoon.
- Very high resolution coupled models for prediction of cyclones with more accuracy and lead time.
- Ocean state forecasts including marine water quality forecasts at very high resolution.
- Tsunami forecasts with greater lead time.
- Air quality forecasts for various cities
- Climate projections at very high resolution.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176000>

#### **4. Creation of Separate Fund for Inter-Linking of Rivers**

The National Perspective Plan (NPP) was prepared by the then Ministry of Irrigation, now Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD & GR) in August 1980 for water resources development through inter basin transfer of water, for transferring water from water surplus basins to water-deficit basins. Under the NPP, the National Water Development Agency (NWDA) has identified 30 links (16 under Peninsular Component and 14 under Himalayan Component) for preparation of Feasibility Reports (FRs). The Pre-Feasibility Report (PFR) of the all 30 links have been prepared and circulated to the concerned State Governments by the NWDA. After survey and investigations, Feasibility Reports of 14 links under Peninsular Component and Feasibility Reports of 2 links and draft Feasibility Reports

of 7 links (Indian portion) under Himalayan Component have been completed.

Groups have been constituted on Financial Aspects on 12.09.2017 under Task Force for Interlinking of Rivers (ILR) to consider the financial aspects of ILR projects and to suggest the funding pattern for implementing the same. Three meetings of the Group on Financial Aspects were held in 2017.

Funds have been released to Indirasagar Polavaram Project through Long Term Irrigation Fund. The Pattiseema Lift Scheme has been envisaged to utilize the already existing Polavaram Right Canal by lifting 240 Cumecs (8500 Cusecs) of water from Akhanda Godavari Right Bank on downstream side of Polavaram dam site near Pattisam village and dropping into Polavaram Right Canal. The main aspect of the Lift Scheme is to transfer 80 TMC of water into Krishna River by interlinking through Polavaram Right Canal.

#### **5. MoU Signed between Botanical Survey of India and Natural History Museum, UK**

Botanical Survey of India (BSI) and Natural History Museum (NHM), UK signed a Memorandum of Understanding for cooperation in the field of genetic / taxonomic studies, research and training, conservation in India, including species and habitat conservation assessments, etc. The MoU will pave the way for BSI staff to work in Natural History Museum, London and vice-versa and will share fairly and equitably the benefits that may arise from the collection, study and conservation of the plant materials such as seeds, herbarium specimens and tissue samples and exchange associated data and images. NHM will help BSI in capacity building in areas of systematic botany and long-term conservation of plant genetic resources in India.

Both countries are committed to the use of scientific evidence to support the goals of the

Convention on Biological Diversity, CITES and the Nagoya Protocol – this MOU will enable research that will underpin these national responsibilities.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176601>

## **6. India among Top Ten Nations in the World in terms of Forest Area.**

India has shown an increasing trend in the forest and tree cover, in comparison to the global trend of decreasing forest cover during the last decade. According to the India State of Forest Report (ISFR) 2017, India ranks among the top ten countries of the world in terms of forest area, despite the fact that none of the other 9 countries has a population density of more than 150 persons per sq km, compared to India, which has a population density of 382 persons per sq km. India is ranked 10<sup>th</sup> in the world, with 24.4% of land area under forest and tree cover, even though it accounts for 2.4 % of the world surface area and sustains the needs of 17 % of human and 18 % livestock population.

The latest assessment shows that there is an increase of 8, 021 sq km (about 80.20 million hectare) in the total forest and tree cover of the country, compared to the previous assessment in 2015. The increase in the forest cover has been observed as 6,778 sq km and that of tree cover as 1, 243 sq km. An encouraging sign is also, that much of the increase in the forest cover has been observed in Very Dense Forest (VDF), as VDF absorbs maximum carbon dioxide from the atmosphere.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176496>

## **7. IREDA and RUMSL signs agreement for Large-Scale Solar Parks in Madhya Pradesh** Indian Renewable Energy

Development Agency Limited (IREDA) and Rewa Ultra Mega Solar Limited (RUMSL) have signed an agreement for financing the shared infrastructure of two large Solar Parks in Madhya Pradesh.

Ministry of New and Renewable Energy (MNRE), World Bank and IREDA have been able to work out a proposal to channelize US\$ 100 Million for creating common infrastructure for ultra-mega solar parks in India to achieve the 100 GW solar capacity addition target by 2022. Under the World Bank Line of Credit, IREDA has sanctioned its first loan of Rs. 210.62 Cr. to RUMSL to finance two such solar parks in the state of Madhya Pradesh. The broad terms and condition of the agreement include fixed interest rate of 8.5% p.a. for entire loan tenure, moratorium from principal repayments upto 5 years and loan repayment period of upto 20 years.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176022>

## **8. ASH TRACK Mobile App for better management of fly ash produced by thermal power plants**

A Web based monitoring System and a Fly Ash mobile application named ASH TRACK were launched recently. These platforms will enable better management of the ash produced by thermal power plants by providing an interface between fly ash producers (Thermal Power Plants) and potential ash users such as – road contractors, cement plants etc.

Proper management of fly ash is important for not only the environment as the ash produced by the power plants occupies a lot of land space. At present, 63 per cent of the fly ash is being utilised and target is for 100 per cent utilisation of the fly ash. There is a need for education and awareness generation. Road contractors and construction engineers need to know the benefits of using fly ash in construction.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176421>

### 9. 2500 government buildings to be fitted with super-efficient ACs for the first time in the country

The Government has decided to install super-efficient air-conditioners in 2, 500 of its buildings for the first time in the country. Launching the replacement of conventional lights with LED lights in East Delhi. Over one lakh conventional air conditioners will be replaced by super-efficient ACs that will consume 30% less power and will be environment-friendly. All automobiles will be converted to electric vehicles, keeping in view the government's commitment to shift to electric mobility by the year 2030.

Over 88 crore LED bulbs have been distributed across India, both by government and private agencies under the Mission Innovation scheme. In East Delhi, the municipal agency will replace one lakh street lights and 2, 800 High Mast Lights with LED lights at "Zero cost", thereby saving energy to the tune of 77.97% in comparison to the existing energy bills.

India has also committed to install 175 GW of solar, wind and biomass electricity by 2022, reduce emission intensity by 33-35% from its 2005 levels by 2030, create an additional carbon sink of 2.5 to 3 billion tonnes of carbon dioxide equivalent by 2030 through additional forest and tree cover and produce 40% electricity from non-fossil fuel based energy resources by 2030.

### 10. Indian scientists develop next generation technology loop to generate clean energy

Indian scientists have developed a super critical carbon dioxide Brayton test loop facility that would help generate clean energy from future

power plants including solar thermal. This next generation technology loop was developed indigenously by Indian Institute of Science, Bangalore.

This is India's first test-bed for next generation, efficient, compact, waterless super critical carbon dioxide Brayton cycle test loop for power generation. The technology is perhaps the first test loop coupled with solar heat source in the world. This test loop is designed to generate the necessary data for future development of scaled up S-CO<sub>2</sub> power plants, which would require overcoming several technological challenges developing critical components such as the turbine, compressor and heat exchangers that can work at the desired pressure and temperature ranges and using materials that can withstand these conditions. This effort has been identified as a possible national initiative for the next generation of solar thermal power plants.

Source:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=176729>

➤ Pankaj Saini

### V. "The Bamako Convention: A platform for a Pollution Free Africa"

#### The Bamako Convention- An Overview

The Bamako Convention is a treaty of African nations prohibiting the import into Africa of any hazardous (including radioactive) waste. The Bamako convention is a response to Article 11 of the Basel Convention which encourages parties to enter into bilateral, multilateral and regional agreements on Hazardous Waste to help achieve the objectives of the convention. The impetus for the Bamako Convention arose also from:

- The failure of the Basel Convention to prohibit trade of hazardous waste to less developed countries (LDCs);
- The realization that many developed nations were exporting toxic wastes to Africa (Koko case in Nigeria, Probo Koala case in Ivory Coast...).

The convention was negotiated by 12 nations of the African Union (former Organization of African Unity) at Bamako, Mali in January, 1991 and came into force in 1998. To date it has 29 Signatories and 25 Parties. The Bamako Convention uses a format and language similar to that of the Basel convention, but is much stronger in prohibiting all imports of hazardous waste and it does not make exceptions on certain hazardous wastes (like those for radioactive materials) made by the Basel Convention.

#### **PURPOSE OF THE CONVENTION**

The convention prohibits the import of all hazardous and radioactive wastes into the African continent for any reason, minimizes and controls transboundary movements of hazardous wastes within the African continent, prohibits all ocean and inland water dumping or incineration of hazardous wastes and ensures that disposal of wastes is conducted in an “environmentally sound manner”. While establishing the precautionary principle it promotes cleaner production over the pursuit of a permissible emissions approach based on assimilative capacity assumptions.

#### **Second Meeting of the conference of the parties at Abidjan, Cote d’Ivoire**

The second Meeting of the Conference of the Parties to the Bamako Convention under the theme “The Bamako Convention: A platform for a Pollution Free Africa” took place in Abidjan, Côte d’Ivoire from 30<sup>th</sup> January 2018 to 1<sup>st</sup> February 2018. The Bamako Convention celebrated twenty years since it entered into force in 1998.

The meeting was attended by ministers responsible for environmental affairs from 25 Parties and other heads of delegation.

*The meeting reviewed* a number of issues pertaining to the effective implementation of the Bamako Convention, decisions adopted at its first meeting held at Bamako in June 2013 as well as those adopted at its Informal Consultative Meeting held at Nairobi in June 2016 and further underlined the importance of the Bamako Convention for Africa and reaffirmed commitment to its implementation.

*It provided an opportunity to the member nations to review that* the Bamako Convention it aligns itself appropriately with relevant existing chemical related instruments, such as, chemical and wastes related conventions and frameworks such as, Strategic Approach to International Chemicals Management (SAICM) as well as 2030 Agenda for Sustainable Development, the 2063 African Union Strategic Agenda and the UN Environment Assembly resolutions adopted at its third session. It also raised concerns on the limited progress made thus far on its implementation by most of the Parties as well as lack of resources from the Parties to support and facilitate its implementation both at national and regional level.

*Concerns were raised on the* content of the Note from the Secretariat on its report on the status of implementation of the Bamako Convention as well as adopted past decisions that no resources have been available from the Parties for the implementation of the approved costed programme of work leading to poor implementation of the Bamako Convention.

*It was requested to the Parties of the Bamako Convention that have not yet informed the Secretariat of the designation or establishment of their competent authorities, focal point and dump watch to do so as soon as possible and to nominate competent experts to the Legal and Technical Working Group and to the Ad-Hoc Expert Group on Liabilities and Compensation.*

The parties appreciated the Libreville Declaration to support effective implementation at national, sub regional and regional level of mechanisms for enforcing compliance with international conventions and national regulations to protect populations from health threats related to the environment, including accession to and implementation of the Bamako Convention by those countries that have not yet done so.

In the convention it was reaffirmed to renew that the political commitment will be towards a platform for a pollution-free Africa through support for the implementation of the Bamako Convention as the contribution to achieving the sustainable development goals for 2030 Agenda and sound management of chemicals and wastes. The convention committed to reaffirm the ambition proclaimed in Bamako on 26 June 2013 to protect vulnerable groups including children and poor communities from negative impacts resulting from unsafe chemical use and unsound waste disposal, and to prevent Africa to become a dumping ground for toxic wastes through an effective implementation of the Bamako Convention.

The convention accepted the offer extended by the Government of Mali to host a Secretariat in Bamako, Mali. Consequently, the Government of Mali and the current Secretariat of the Bamako Convention was requested to develop a roadmap, with inputs from the Parties, for the establishment of the permanent secretariat and report its status at the Extra-Ordinary meeting of the Conference of the Parties to be held in Sudan in early 2019. In the meantime, the United Nations Environment Programme would continue to provide the secretariat support and services it has been providing as authorized by its governing.

It was asserted to take concerted measures individually as Parties and jointly together to fund raise for the prioritized activities for the effective implementation of the Bamako Convention. The Secretariat was requested to work in cooperation with the Parties to develop

a fund raising strategy which can be used by both the Secretariat and the Parties to fund raise for the national as well as regional activities necessary for the effective implementation of the Bamako Convention.

The Executive Secretary of the current Secretariat was requested to nominate and / or designate a dedicated focal point to work and collaborate on a regular and continuous basis with the Parties, non-Parties and partners in supporting the effective implementation of the Bamako Convention.

The parties committed to guarantee and secure a total ban of imports to Africa and control of transboundary movement of hazardous wastes, urge those countries in Africa not yet parties to the Bamako Convention to see its merit and ratify or acceded to it and develop and / or review and update national strategies, policies, legal, administrative and institutional frameworks as well as action plans necessary for the domestication of the Bamako Convention and its effective implementation.

The parties ensured to promote coherence and synergies between the Bamako Convention and other chemical and hazardous wastes related conventions, in collaboration with relevant secretariats, to conduct joint capacity development and capacity building activities including training, research programmes and awareness raising and further enhance, advocate and promote cooperation as well as develop stronger partnerships with relevant partners, such as, the regional economic communities and Regional Basel Convention Centres for the effective implementation of the Bamako Convention.

The parties reiterated to intensify efforts to achieve by 2020 the goal for the environmentally sound management of chemicals and wastes throughout their life cycle with Bamako Convention serving as an implementation tool for the achievement of the sustainable development goals and protection of human health and the environment as underlined in SAICM and take concrete

actions needed for the implementation of the decisions which were adopted at past as well as present Conference of the Parties.

The Governments of Sudan and the Republic of Congo, through their Ministers, offered to host the Extra-ordinary Conference of the Parties in early 2019 as well as the third Conference of the Parties in 2020 respectively at the dates to be determined in due course;

➤ **Manoj Kumar**

**VI. Judgement of National Green Tribunal, Principal Bench, New Delhi Himmat Singh Shekhawat & Ors. vs State of Rajasthan which is based on sand mining or minor mineral extraction on riverbeds.**

The National Green Tribunal Bar Association filed Original Application No. 171 of 2013 under Sections 14 and 15 read with Sections 18 (1) and 18 (2) of the National Green Tribunal Act, 2010 stating that illegal sand mining in the Yamuna riverbed was going on in violation of law, without taking prior Environmental Clearance.

The applicant relied upon the judgment of the Supreme Court in Deepak Kumar v. State of Haryana, (2012) 4 SCC 629. The application was filed with the prayer that the Tribunal should direct the authorities to take appropriate legal action against all sand mining which was being carried on without seeking prior Environmental Clearance or wherever Environment Clearance has been granted, in violation of its conditions. It was also prayed that respondent authorities should formulate proper scheme to prevent illegal mining.

Himmat Singh Shekhawat filed an Original Application No. 123 of 2014, submitting that, he was the holder of Letter of Intent issued by the State of Rajasthan for excavation of minor mineral. According to him, he fulfilled three conditions for the grant and execution of mining lease. On 8 January, 2014, the State of

Rajasthan issued guidelines as well as a notice on 6 May, 2014 for auction of minor minerals. The applicant was aggrieved from the procedure being adopted by the State Government. Thus, he prayed that the guidelines issued by the State of Rajasthan dated 8 January, 2014 and the Public Notice dated 6 May, 2014, by the State of Rajasthan, should be quashed and as an interim order, its operation should be stayed.

MoEF issued an amendment to EIA Notification vide Notification S.O. 2731 (E) dated 9th September 2013 and amended the EIA Notification, 2006. In this Notification a new category of minor mineral was introduced and it was provided that mining lease area of minor mineral less than 50 ha will be category 'B' and will require EC. Accordingly the minor mineral mining projects having less than 5 hectare of lease area are required to be appraised by the SEIAA/SEAC of respective State for granting environment clearance. It was provided that the project or activity of less than 5 ha of mining lease area for minor minerals will be exempt from the General Conditions. Simultaneously the concept of cluster was introduced and it was provided that the exemption of applicability of General Conditions shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded EC and are located within 500 m from the periphery of such project or activity equal or exceeds 5 ha.

The Ministry, on 24th December, 2013, issued another Office Memorandum for consideration of proposals for grant of Environmental Clearance regarding categorisation of Category 'B' projects into Category 'B (1)' and 'B (2)'. Mining of minor minerals had been separately dealt with in this Office Memorandum. This Office Memorandum stated that no river sand mining project with mining lease area of less than 5 hectares may be considered for grant of Environmental Clearance. Such area up to 25 hectares would be categorised as 'B (2)' and

such projects were to be considered, subject to the stipulations stated therein. This Office Memorandum stated that no Environmental Clearance would be granted for extraction of minor minerals from any riverbed where the area is less than 5 hectares. Sand mining, in area other than riverbeds, would be permitted, only if the Project Proponent takes Environmental Clearance

In Original Application No. 123/2014 filed by Shri Himmat Singh, the challenge was raised for the guidelines issued by the Government of Rajasthan dated 8th January, 2014 and to the Office Memorandum issued by MoEF on 24th December, 2013. The challenge, was primarily based on the ground that attempt of both these documents is to permit illegal and unauthorised mining activity by directly auctioning and permitting mining in the areas less than 5 hectares or even between 5 to 25 hectares. Such action, being contrary to the very scheme under the EIA Notification of 2006 and order of the Hon'ble Supreme Court in the case of Deepak Kumar (supra), the Tribunal had granted an injunction for carrying of mining activities without obtaining proper mining lease, Environmental Clearance and other requisite permissions, in accordance with law.

According to State of Rajasthan, post Notification dated 9 September, 2013, issued by the MoEF, they had not granted any mining lease without Environmental Clearance. However, in the period between 27 February, 2012 and 9 September, 2013, mining leases for minor minerals were granted to all the private respondents as no Environmental Clearance was required for such activity. Directions contained in the case of Deepak Kumar were followed by requiring clusters to make Environment Management Plan. It was further submitted by the State of Rajasthan, that, after the operation of the Office Memorandum issued by MoEF dated 24th December, 2013, was stayed by this Tribunal, the State has not given effect to the Office Memorandum dated 24th June, 2013 also, which, has in fact, became one of the grievances of the private respondents in OA No. 123 of 2014.

According to the State, prior to Deepak Kumar's judgment (supra), mining in less than 5 hectare was allowed without Environmental Clearance. Hence, order in the case of Deepak Kumar (supra) had no application to the leases which existed prior to 27 February, 2012, and accordingly, Notifications issued by the MoEF dated 9 September, 2013 and 16 December, 2013, had no application to the cases.

State of Rajasthan amended its Rules after the judgment of the Hon'ble Supreme Court in Deepak Kumar (supra). Rajasthan Minor Mineral Concession Rules, 1986 were amended by Notification dated 3rd May, 2012. Under these Rules, following are the most noticeable aspects.

- First relates to permission for carrying on mining activity in an area of less than 5 hectares, that too without obtaining the Environmental Clearance from SEIAA / MoEF. It has created District Level Environmental Committees to whom application of Environmental Clearance is to be moved and which has to recommend grant / refusal of such clearances. It has permitted cluster-mining by stating that an Environmental Management Plan could be submitted for such cluster mining and permits could be given for an area of less than 5 hectares. The short-term permit holders of the lease in clusters were required to form an association and file applications along with the Environment Management Plan to the District Committee for approval in terms of Rule 37P. Under proviso to this Rule, the permit holders of short-term permits within the boundary of the cluster after formation of the association will be deemed to be members of the association. All these issues are not in conformity with the law in force and the judgment of the Hon'ble Supreme Court.

- Secondly, they also suffer from the infirmity of imposing obligations on a person who may not be desirous of becoming a member of the association within the cluster boundaries. The 'deeming fiction' contained in proviso to Rule 37Q would not stand the scrutiny of law. It is in fact impractical as well

as unsustainable. This would encourage what the Hon'ble Supreme Court has specifically discourage in the case of Deepak Kumar (supra) that persons carrying on mining activity should not be permitted by creating smaller segments of the areas of the mining activity and then forming a cluster or even without forming the clusters carrying on the mining activity degrading the environment and ecology of the area.

The Rules amended by the State of Rajasthan thus, were not in line with the dictum of the Hon'ble Supreme Court and even the Notifications issued by the MoEF including the Notification of 2006.

The Union Parliament is vested with the powers of making laws for regulation and development of mines and minerals so far they are expedient in public interest. Similarly, legislative power is vested in the State but it is subject to the provisions of List I. The Parliament having enacted the Act of 1957, the Rules for regulation that can be framed by the State Legislature under Section 15 of the said Act has to be compliant of the Parliamentary legislation. In other words, whatever rules are to be framed by the State Government, they should be in conformity with the Act of 1957 as well as with the Act of 1986. In terms of Article 141 of the Constitution, the Judgment of the Hon'ble Supreme Court is the law of the land and is binding on all concerned. The State Government while framing Rules in exercise of powers of delegated legislation has to be conscious of the fact that such legislation is expected to be in conformity with the law of the land as declared by the Hon'ble Supreme Court. The said Rules thus, so framed have to be in conformity with all, the two enactments, i.e., the Act of 1957 and Act of 1986 and Judgment of the Hon'ble Supreme Court.

There were some other cases pertaining to the process of mining in the states of Himachal Pradesh and Karnataka which were also decided by NGT along with this case. The NGT found that there was an apparent contradiction between the Rules framed by the

State under the shelter of the Judgment of the Hon'ble Supreme Court in the case of Deepak Kumar (supra) on the one hand and the Central Law and Notifications on the other. This created uncertainty in fact and in law. To put it more plainly, the actions taken by the State Governments post the case of Deepak Kumar (supra) created more problems than it ought to have solved by the Hon'ble Supreme Court in its judgment.

The NGT in its conclusion stated that keeping in view of the persistent conflict between the State Regulations and the Central Notifications, it was imperative to issue directions specially to provide for an interim period, during which appropriate steps should be taken to comply with the Judgment of the Hon'ble Supreme Court and to issue Notifications which are necessary in that regard. NGT has passed the following order and directions:

I. The Notification dated 9th September, 2013, which amended the EIA Notification by including a category of 'Minor Mineral' in the schedule, is invalid and inoperative for non-compliance of the statutorily prescribed procedure under the Environment (Protection) Rules, 1986 and for absence of any justifiable reason for dispensation of such procedure.

II. The Office Memorandums dated 24th June, 2013, which sub-categorizes Category "B" projects / activities into Category "B1" and "B2" under EIA Notification, 2006 and 24th December, 2013, which provided that "No river sand mining project, with mine lease area less than 5 Ha, may be considered for granting EC" are invalid and inoperative partially to the extent of being beyond the power of delegated legislation.

III. All the Office Memorandums and Notifications issued by MoEF i.e. 1st December, 2009, 8th May, 2012 and 24th June, 2013 and 24th December, 2013 (except to the extent afore-stated) are operative and would apply to the lease mine holders irrespective of the fact that whether the area involved is more or less than 5 hectares.

IV. The existing mining lease right holders would have to comply with the requirement of obtaining Environmental Clearance from the

competent authorities in accordance with law. However, all of them, if not already granted Environmental Clearance would be entitled to a reasonable period (say three months) to submit their applications for obtaining the same, which shall be disposed of expeditiously and in any case not later than six months from pronouncement of this judgment.

V. All the States and the Ministry of Environment and Forest shall ensure strict compliance to the directions issued by the Hon'ble Supreme Court in the case of Deepak Kumar (supra). Secretary, Ministry of Environment and Forest to hold meeting with the State of Rajasthan, Himachal Pradesh and Karnataka to bring complete uniformity in application of the above referred Notifications and Office Memorandums including the Notification of 2006.

VI. In the meeting it shall also disused and appropriate recommendations be made and placed before the Tribunal, as to whether riverbed mining covering an area of less than 5 hectares can be permitted, if so, the conditions and regulatory measures that need to be adopted in that behalf.

VII. The District Environmental Committees constituted by the respective State Governments shall not discharge any functions and grant approval as contemplated under the Notification of 2006.

VIII. Secretary, Ministry of Environment and Forest along with such experts and the States afore-referred will also consider the possibility of constituting the branches of SEIAA at the district or at least, division levels, to ensure easy accessibility to encourage the mine holders to take Environmental Clearance expeditiously.

IX. In large number of cases, particularly in relation of State of Rajasthan, persons carrying on mining activity of minor minerals, non-coal mining and brick earth and ordinary earth have applied for obtaining Environmental Clearances in accordance with the terms and conditions of the Notification of 2006. Let all such applications be dealt with and orders passed by the concerned authorities

at the earliest and in any case not later than six months from today.

X. Respondent authorities, particularly SEIAA, to dispose of the application of all private respondents who have already filed applications seeking Environmental Clearance as expeditiously as possible, in any case not later than three months from the date of judgement.

XI. Dispose of Original Application No. 123/13 with a direction that SEIAA shall consider the applications filed for seeking Environmental Clearance in accordance with law and observations made in this judgment, expeditiously, and in any case within a period of three months from the date of judgement. XII. In the meanwhile, no State shall permit carrying on of sand mining or minor mineral extraction on riverbed or otherwise without the concerned person obtaining Environmental Clearance from the competent authority.

XIII. The Ministry of Environment and Forest to issue comprehensive but self-contained Notification relating to all minor mineral activity on the riverbed or otherwise, to avoid unnecessary confusion, ambiguities and practical difficulties in implementation of the environmental laws.

XIV. In light of the judgment of the Supreme Court and what has emerged from the various cases that are subject matter of this Judgment, the Ministry of Environment and Forest to formulate a uniform cluster policy in consultation with the States for permitting minor mineral mining activity including, its regulatory regime, in accordance with law.

#### **Significance of Judgement:**

The judgement has brought out the issues of coordination in the actions of the union government and various state governments and made it clear that the parliamentary legislations and the Supreme Court judgements have to be complied holistically while deciding issues in the states. The MoEFCC has issued Sustainable Sand Mining Management Guidelines 2016 which was after this judgement while Ministry of Mines has recently (February 2018) invited comments

and suggestions on its 'Draft Sand Mining Recommendations'. The judicial decisions along-with the guidelines of the Ministries may lead to better environmental governance and sustainable development in relation to the sand mining in the country.

➤ **Manoj Kumar**

## VII. Plastic Waste Management Rules, 2016: A Critical Analysis

India is still struggling with managing its plastic wastes with about 15,342 tonne of plastic waste generated every day. The Government notified Plastic Waste Management (PWM) Rules, 2016 suppressing the erstwhile Plastic Waste (Management and Handling) Rules, 2011.

PWM Rules 2016 provide a good framework for addressing the problem of plastic waste; however, they fail to address the key objective of reducing / minimizing use of plastic in the first place. Multi-stakeholder collaboration is needed for scalable solutions and to avoid adverse environmental impact of plastic waste.

Undeniably, the new Plastic Waste Management Rules which were released on March 18, 2016 arrived with a lot of attention-about 238 suggestions / objections were recorded through consultative meetings on the draft rules of 2015, which were later examined by the Working Group, which gave recommendations and eventually paved way for these new set of rules as PWM Rules, 2016.

The key areas which these new rules thrust on, are-

- Emphasizing on plastic waste recycling, source segregation.
- Making the waste pickers, recyclers and waste processors an integral part of the whole system.
- Adopting the "polluter-pays principle" for the ensuring sustainability in waste management.

### Comparison with earlier rules:

Following are some of the key areas where the new Rules make a departure from the older 2011 rules:

#### 1. Scope of application

Unlike PW Rules, 2011 which were applicable to municipal areas the PWM Rules, 2016 are applicable to every waste generator, gram panchayat, local bodies, manufacturers, Importers and producers. The jurisdiction is also extended to rural area as plastics reaching rural areas has been acknowledged. The Responsibility for implementation of the rules in rural areas is given to Gram Panchayat

#### 2. Prohibition

The minimum thickness of plastic carry bags has been increased from 40 to 50 microns under new Rules.

#### 3. Responsibility of Waste Generators

Waste generators like- event organisers, institutional generators etc. earlier were not under any specific responsibility, within these rules. As per PWM Rules, 2016 individual and bulk generators like commercial establishments, offices, industries, event organizers have to segregate the plastic waste at source, handover segregated waste, and also pay user fee as prescribed by Urban Local Body and there are provisions for on spot fine in case of any violation.

#### 4. Responsibility of retailers, street vendors

In earlier rules there was no responsibility fixed on the retailers and street vendors but according to new rules the shopkeepers, or street vendors registered with the local body after payment of a fee (Rs. 48,000/- @ Rs 4,000/- per month) only will be eligible to provide plastic carry bags for **dispensing the commodities**.

#### 5. Extended Producer Responsibility (EPR)

PWM Rules 2016 brings in EPR for producers and brand owners – making them responsible for the waste generated from their products, for the first time. Earlier, it was left to the discretion of the local bodies.

**Critical Analysis:**

The new rules are revised and broader in scope than the earlier rules of 2011 some illustrations from the same are listed above. Certain new initiatives / promises in PWM Rules, 2016 like-plan of phasing out of multi-layered plastic in packaging within two years, strengthening monitoring or making the local authorities accountable and an important part of the waste management gamut have been well appreciated. Even the idea of promoting energy recovery / waste-to-oil and use of plastic waste for road construction as per the “Indian Road Congress guidelines” for better utilization of waste have been brought up by these new rules. But, there have been concerns regarding implementation of these professed statements.

In case of Extended Producer Responsibility (EPR) the manufacturers, producers, importers jointly seek for clear guidelines on EPR responsibilities and clarification on key matters like- what is the expectation from the Industry and in what capacity, confusion in pricing and marking of bags, applicability to cling films etc. Further, certain conditions like- clear standards and specification of maximum decomposition time to allow composting is still missing in the new rules.

It has been argued that complete substitutability of plastic has not been found yet and so imposing a ‘blanket ban’ on use of plastic in India could be impractical and is not the solution. Managing these plastic wastes efficiently and sustainably is the true need for a country like India which is so diverse in demands and densely populated. At a macroeconomic level, there is a need in India to learn from other successful countries’ examples for best plastic waste management, like from Germany, Denmark within Europe’s “Zero Waste Management System” which works with a philosophy of designing and managing products / processes, reducing the volume and toxicity of wastes and conserving and recovering all resources, instead of burning / burying them.

The need of realistically testing the rules on local level has been advocated by some sections before their national implementation for speedier and visible improvements. The need for EPR Policy to be comprehensively articulated, clear directions and incentives on integrating informal sector are also considered crucial for the success of the Rules.

Multi-stakeholder collaborations including policy makers, ULBs, waste generators / end consumers, plastic industry, solution providers etc. needs to be encouraged to find a sustainable (both technically, financially and socially) approach for plastic waste management in India. Scalable solutions which will help in achieving zero significant adverse environmental impact of plastic waste are the need of the hour. Each stakeholder needs to fulfil their responsibilities well, like-innovators / solution providers should build on more plastic waste treatment technologies; industries, producers should implement more renewability / recyclability in their products; while ULBs and policy developers should create scalable models for plastic waste treatment / processing.

*Virendra Jakhar*

**VIII. Performance Audit of Rejuvenation of River Ganga (Namami Gange). Report No.39 of 2017**

**Introduction**

The Ganga is the National River of India. Considering its very special place in the collective consciousness of this country, the Government of India approved (May 2015) the Integrated Ganga Conservation Mission, namely Namami Gange, as an umbrella programme with the aim of integrating previous and currently ongoing initiatives for the rejuvenation of the river.

The National Mission for Clean Ganga (NMCG) was constituted as an authority under Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD&GR) to ensure implementation

of programmes for pollution prevention and Rejuvenation of the River Ganga Basin. It has the responsibility for overall project planning and management, direct implementation of national level activities and ensuring satisfactory implementation of State level investments and activities relating to the River Ganga.

The erstwhile Ministry of Water Resources was renamed (July 2014) as Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD & GR) to bring about a comprehensive approach to this national priority and the National River Ganga Basin Authority including the Mission Directorate, NMCG and other related matters of Ganga and its tributaries were allocated to this Ministry. NGRBA was subsequently reconstituted (September 2014) and its mandate was modified to include measures for effective abatement of pollution and Rejuvenation of the River Ganga.

In October 2016, the Government of India dissolved the NGRBA and constituted the National Ganga Council to act as an authority having overall responsibility for superintendence of pollution prevention and Rejuvenation of the River Ganga Basin. NMCG was converted into an authority vested with powers to issue directions and exercise powers under the Environment (Protection) Act, 1986. Secretary, MoWR, RD&GR is the Chairman of the Governing Council of NMCG.

The Performance Audit on 'Rejuvenation of River Ganga (Namami Gange)' for the year ended March 2017 was conducted .

### **Audit Objectives**

The Performance Audit intended to examine whether:

- the estimation, availability and utilization of funds was adequate and reliable;

- various schemes/projects were planned as per prescribed framework;
- projects on sewerage, Ghats and crematoria, river front development, canals and rural sanitation were implemented in accordance with milestones prescribed under Namami Gange in an economic, efficient and effective manner;
- execution of projects for conservation of flora, fauna and maintenance of river flows were implemented in effective and efficient manner;
- human resources were adequate;
- the directions of the Hon'ble Uttarakhand High Court were complied with; and
- effective monitoring and evaluation mechanism was put in place for realization of the outcomes of projects under Namami Gange.

### **Scope of Audit**

Government of India announced Namami Gange (July 2014) with the aim of integrating previous and currently ongoing initiatives. Focus was on the activities which took place during the period from 2014-15 to 2016-17. However, also covered were the projects sanctioned prior to announcement of Namami Gange but ongoing during 2014-17 and the relevant records / documents of prior years where pertinent.

As on 1 April 2014, 55 projects costing Rs.4,588.35 crore were ongoing and 90 projects costing Rs.6,386.90 crore were sanctioned during 2014-17. Of these 145 projects costing Rs.10,975.25 crore, 11 were institutional projects (sanctioned cost Rs. 285.12 crore), five afforestation projects (sanctioned cost Rs.50.62 crore), one Biodiversity project (sanctioned

cost Rs.76 lakh) and 128 were infrastructural projects (sanctioned cost Rs.10,638.75 crore).

A total of 87 projects were selected including 70 infrastructural (sanctioned cost of Rs.7,655.84 crore) and all 11 institutional projects, five afforestation projects and one biodiversity project. Of these selected 87 projects, 73 were ongoing, 13 were completed and one was an abandoned project. The projects were selected based on risk assessment on parameters such as preliminary/ detailed estimates, sanctioned cost, delay in execution, status of work, cost overrun, pollution load of the town on the River Ganga, threats to river and its tributaries, etc.

### **Audit Methodology**

Records of various entities involved in implementation of projects relating to Rejuvenation of River Ganga like NMCG, CPCB, State Governments and their authorities, local bodies, central public sector enterprises and Autonomous bodies associated with the programme were selected for examination.

### **Performance Audit Findings**

#### **Financial Management**

Only eight to 63 per cent of the funds allocated in the Revised Estimates were utilised during 2014-15 to 2016-17. Funds amounting to Rs.2,133.76 crore, Rs.422.13 crore and Rs.59.28 crore were lying unutilised with National Mission for Clean Ganga, various State Programme Management Groups and Executing Agencies / Central Public Sector Undertakings respectively as on 31 March 2017.

There were delays in submission of Utilisation Certificates in respect of all State Programme Management Groups. State Programme Management Groups of Uttar Pradesh and West Bengal did not conduct their internal audit as per prescribed frequency (quarterly) during 2014-17. Internal audit was not conducted at all

in respect of State Programme Management Groups of Bihar and Uttarakhand.

A corpus of Rs.198.14 crore (as of 31 March 2017) was available in the Clean Ganga Fund. However, National Mission for Clean Ganga could not utilize any amount out of the Clean Ganga Fund and the entire amount was lying in banks due to non-finalization of action plan.

#### **Planning**

National Mission for Clean Ganga could not finalise the long-term action plans even after more than six and half years of signing of agreement with the consortium of Indian Institutes of Technology. As a result, NMCG does not have a river basin management plan even after a lapse of more than eight years of National Ganga River Basin Authority notification.

Out of 154 Detailed Project Reports pertaining to 2014-15 to 2016-17, only 71 Detailed Project Reports were approved. Of these 71 Detailed Project Reports, 70 were approved after delays ranging from 26 to 1,140 days. Out of remaining 83 Detailed Project Reports, 54 were pending at NMCG level for a period ranging from 120 to 780 days.

River Conservation Zones were not identified in the States of Uttar Pradesh, Bihar, Jharkhand and West Bengal, till May 2017. In Uttarakhand the identification was under progress.

#### **Pollution Abatement and Ghat Development**

As per the target dates, award for the work of all the Sewage Treatment Plants was to be completed by September 2016. National Mission for Clean Ganga was yet to finalise and approve Detailed Project Reports for projects totalling 1,397 MLD capacity as of August 2017.

Out of 45 Sewage Treatment Plants, Interception and Diversion projects and Canal works costing Rs.5,111.36 crore, there were delays in 26 projects costing Rs. 2,710.14 crore

due to delay in execution of projects, non-availability of land, slow progress of work by contractors and under-utilisation of Sewage Treatment Plants. Projects relating to Ghats and Crematoria works suffered from non-obtaining of requisite clearances.

### **Rural Sanitation**

Against the total funds of Rs. 951.11 crore released by NMCG and State Governments for activities relating to construction of Individual Household Latrines, Information, Education and Communication and Solid Liquid Waste Management, the five States namely Bihar, Jharkhand, Uttarkhand, Uttar Pradesh and West Bengal could utilise only Rs.490.15 crore.

Except Uttarakhand, the other four States namely Bihar, Jharkhand, Uttar Pradesh and West Bengal could not achieve the target of construction of 100 per cent Individual Household Latrines as of 31 March 2017. Solid Liquid Waste Management activities were not taken up in any of the identified districts of the States of Uttar Pradesh, Bihar, Jharkhand and West Bengal. In Uttarakhand, work relating to Solid Liquid Waste Management in two out of 132 Gram Panchayats were completed and were in progress in 11 Gram Panchayats as of March 2017.

There were discrepancies in the data reported under Management Information System and basic records maintained by Gram Panchayats in 12 test-checked districts of Uttar Pradesh and Jharkhand.

### **Conservation of Flora & Fauna and Maintenance of Ecological Flow**

The number of projects for conservation for flora, fauna and river flow were very limited as compared to projects for pollution abatement and river front development. The long term action plan for Ganga Rejuvenation was yet to be finalised based on Ganga River Basin Management Plan.

Ecology and biodiversity conservation efforts of NMCG were at a very initial stage and it

suffered from deficiencies in programme implementation. There was short release of funds for forestry interventions, coverage on ground for biodiversity conservation and non-sanction of any projects for study of the maintenance of ecological flow.

In Bihar and Jharkhand, no interventions for Agriculture and Urban Landscape were undertaken in the identified districts / divisions. In Bihar, conservation and support activities were also not undertaken. In Uttarakhand, shortfall under natural landscape, agricultural landscape, urban landscape and conservation interventions were noticed.

NMCG did not identify places of discontinuity of water flow due to engineered diversion or storage and did not initiate any remedial action thereof, as required under the notification of October 2016.

### **Human Resource Management**

There was overall shortage of manpower ranging from 44 to 65 per cent during 2014-15 to 2016-17 in NMCG.

In State Programme Management Groups (SPMGs), the overall shortage ranged between 20 to 89 per cent.

NMCG did not initiate any proposal for strengthening the human resources of SPMGs.

### **Monitoring and Evaluation**

- Monitoring Bodies / Committees such as Governing Body, High Level Task Force, Empowered Task Force and Governing Council did not meet as per the required frequency.
- The mandate of establishment of 'Ganga Monitoring Centre' was still under conceptualization and planning phase at NMCG as of July 2017.
- Implementation of Bhuvan Ganga Web-portal to enable planning, execution and monitoring of investment projects as well as providing platform

for central repository of all data through GIS mapping was slow.

- Against an amount of Rs.198.48 crore sanctioned to Central Pollution Control Board for three projects on monitoring and evaluation, expenditure of only Rs. 14.77 crore (7.44 per cent) was incurred as of March 2017.
- Against 5,016 compliance verifications required to be conducted by CPCB in respect of 988 Grossly Polluting Industries, only 3,163 compliance verifications were conducted during 2011-17. Against the 120 mandatory adequacy assessments required to be conducted in respect of five identified Common Effluent Treatment Plants, only 17 were carried out as of August 2017. Against the mandatory 560 inspections to be carried out for performance evaluation of 67 STPs, only 177 were carried out as of August 2017.
- CPCB could deploy only 36 Automatic Water Quality Monitoring Systems as against 113 sites identified along the River Ganga for continuous receipt of water quality monitoring on real-time basis.
- In six<sup>1</sup> cities of Uttar Pradesh, Bihar and West Bengal, Dissolved Oxygen declined from 2012-13 levels. Biochemical Oxygen Demand was higher than the prescribed limit in the three towns (Kanpur, Allahabad and Varanasi) of Uttar Pradesh. During 2016-17, Total Coliform levels in all the cities of Uttar Pradesh, Bihar and West Bengal was very high ranging between six to 3346 times higher than the prescribed levels. Specific parameters for water quality monitoring of the river

Ganga have not been prescribed by National Mission for Clean Ganga.

### Recommendations

Based on the audit findings, following recommendations were made:

1. NMCG may prepare Annual Action Plan, align Budget Estimates based on Annual Action Plan and take appropriate action to regularly review actual expenditure vis-à-vis budget allocation.
2. NMCG may ensure preparation and timely submission of UCs / consolidated Financial Statements by SPMGs, for regular monitoring of the expenditure.
3. NMCG may ensure Internal Audit of all the SPMGs as per the prescribed frequency.
4. MoWR, RD&GR may release subsequent grants to NMCG, after taking into account the unspent balances available with NMCG/ SPMG/ EAs, etc. at the end of the financial year.
5. NMCG may formulate the action plan for augmentation and utilization of Clean Ganga Fund.
6. NMCG may finalize Ganga River Basin Management Plan for implementation of long-term intervention on Ganga Rejuvenation on priority and implement it in a time bound manner.
7. NMCG may ensure appraisal of DPRs as envisaged in NGRBA framework in time bound manner.
8. NMCG may identify and declare River Conservation Zones on priority, in order to conserve the River Ganga from encroachment and construction activities.
9. NMCG may address the capacity gaps of sewerages pertaining to all towns and villages comprehensively and plan sewage

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Kanpur, Varanasi (downstream), Patna, Munger, Gayespur and Budge Budge

systems, STPs, Interception and Diversion works accordingly in a time bound manner.

10. NMCG/ SPMGs may synchronize Interception and Diversion Projects with setting up of Sewage Treatment Plants and their operationalization for ensuring that no untreated sewage flows into the River Ganga.

11. NMCG, SPMGs in consultation with the State Government authorities and Executing Agencies may make tripartite agreements for making land available before awarding the contracts.

12. NMCG, in consultation with MoDW&S, may ensure the optimum utilisation of available funds with the State Governments.

13. NMCG, in consultation with MoDW&S, may ensure more realistic planning, data integrity and strict monitoring for achievement targets.

14. NMCG and MoDW&S may ensure the reliability of the data reported under MIS by cross checking with monthly physical/ financial reports submitted by all Swachh Bharat Mission (Gramin) Project Districts.

15. NMCG may identify threats and implement programmes/schemes to maintain the Ganga river ecology and conserve flora and fauna in sustainable and time bound manner.

16. NMCG may on priority address the concerns of Aviral Dhara by identifying the discontinuity of flow of the River Ganga water due to engineering diversion or storage so as to determine and maintain the ecological flow.

17. NMCG may frame recruitment rules for filling-up the vacancies and increase the sanctioned strength for effectively implementing the projects both at NMCG and SPMG levels.

18. NMCG may have regular meetings for monitoring of Ganga Rejuvenation Programmes, make recommendations and actionable points and follow up scrupulously.

19. NMCG may make all efforts to expedite the work already assigned to CPCB on monitoring of pollution, inventorization of crucial parameters of pollution, surveillance on the River Ganga and strengthening of regulators.

20. NMCG may expedite the setting up of Ganga Monitoring Centres as envisaged in River Ganga (Rejuvenation, Protection and Management) Authorities Order (2016).

21. NMCG may use geo-spatial data of National Remote Sensing Centre for better monitoring.

➤ Pawan Meena

**IX. International Audit Report: RENEWABLE FUEL STANDARD –by Government Accountability Office (GAO), United States of America (USA)**

### Background

US Congress established the Renewable Fuel Standard (RFS) as part of the Energy Policy Act of 2005, in response to concerns about the nation's dependence on imported oil. The RFS initially required that a minimum of 4 billion gallons of renewable fuels be blended into transportation fuels in 2006, ramping up to 7.5 billion gallons by 2012. Two years later, the Energy Independence and Security Act of 2007 (EISA) increased and expanded the statutory target volumes for renewable fuels to 9 billion gallons in 2008 and 36 billion gallons in 2022. The EISA volumes can be thought of in terms of two broad categories:

- i. **Conventional biofuel:** Biofuels from new facilities must achieve at least a 20-percent reduction in greenhouse gas emissions, relative to 2005 baseline petroleum-based fuels. The dominant biofuel produced to date is conventional corn-starch ethanol, although recently some conventional biodiesel has also entered the fuel supply.

ii. **Advanced biofuel:** Biofuels, other than ethanol derived from corn starch must achieve at least a 50-percent reduction in life-cycle greenhouse gas emissions, as compared with 2005 baseline petroleum-based fuels. Advanced biofuel is a catch-all category that may include a number of fuels, including those made from any qualified renewable feedstock, such as ethanol derived from cellulose, sugar, or waste material. This category also includes the following:

**Biomass-based diesel:** Advanced biomass-based diesel must have life-cycle greenhouse gas emissions at least 50 percent lower than traditional petroleum-based diesel fuels.

**Cellulosic biofuel:** Advanced biofuel derived from any cellulose, hemicellulose, or lignin that is derived from renewable biomass must have life-cycle greenhouse gas emissions at least 60 percent lower than traditional petroleum-based fuels. This category of fuel may include cellulosic ethanol, renewable gasoline, cellulosic diesel, and renewable natural gas from landfills that can be used to generate electricity for electric vehicles or used in vehicles designed to run on liquefied or compressed natural gas.

US Environmental Protection Agency (EPA) administers the RFS in consultation with US Department of Energy (DOE) and US Department of Agriculture (USDA). EPA, defines the goals of the RFS as to (1) reduce greenhouse gas emissions and (2) expand the nation's renewable fuel (or biofuel) sector while reducing reliance on imported oil. In addition, many experts and industry stakeholders agree that the RFS has an implicit purpose of supporting the domestic agricultural economy. EPA's responsibilities for implementing the RFS include setting annual volume requirements. Each year, by November 30, EPA is required to establish via rulemaking the volumes of biofuel that must be blended into

transportation fuels during the following calendar year (volume requirement). The statute provides EPA with waiver authority to set volumes below the targets specified in the statute under certain circumstances, such as when there is inadequate domestic supply. The structure of the volume targets emphasized conventional biofuels in the early years covered by the statute, while providing lead time for the development and commercialization of advanced, and especially cellulosic, biofuels. However, these fuels have not been produced in sufficient quantities to meet statutory targets through 2016. As a result, since 2010, EPA has used its waiver authority to deviate from the statutory target volumes and has reduced the volume requirement for cellulosic biofuel every year, citing inadequate domestic supply, among other things.

Further, in December 2015—when EPA finalized the volume requirements for 2014, 2015, and 2016—the agency reduced the total renewable fuel requirement for those years. Effectively, this meant that EPA reduced the amount of conventional biofuels required under the program relative to statutory targets for those years. In this case, EPA cited constraints in the fuel market's ability to accommodate increasing volumes of ethanol. EPA's use of this waiver authority has been controversial among some RFS stakeholders, and EPA's 2015 requirement currently faces legal challenges from multiple parties. However, in the volume requirement it finalized in November 2016, EPA effectively set the amount of conventional biofuels required under the program at 15 billion gallons, equal to the statutory target for 2017.

#### **Audit Objectives:**

In November 2016, GAO issued this report GAO-17-94 the audit objectives of which were to provide information on

- i. Whether the Renewable Fuel Standard (RFS) is expected to meet its goals;

- ii. Expert views on any federal actions that could improve the RFS framework; and
- iii. Policy alternatives experts suggested to better meet the goals of the RFS in the future.

### Audit Methodology:

Audit methodology included a combination of following:

- i. Analysis of legal requirements and EPA data.
- ii. GAO also contracted with the National Academy of Sciences for a list of experts on issues related to the RFS including the current structure of the RFS; blending, distribution, and marketing infrastructure of biofuels; automobile manufacture; and petroleum consumption and prices. GAO worked with the National Academy of Sciences and a meeting of experts from industry, academia, and research organizations was convened in May 2016. Semi-structured interviews with experts were conducted and a content analysis of the 24 experts' responses to GAO's questions was performed. For reporting purposes, expert responses were categorized as follows:
  - "nearly all" experts represents 21 to 23 experts,
  - "most" experts represents 16 to 20 experts,
  - "many" experts represents 11 to 15 experts,
  - "several" experts represents 6 to 10 experts, and
  - "some" experts represents 2 to 5 experts.
- iii. Public comments from stakeholders, relevant legislation, and agency documents pertaining to annual volume requirements (e.g., the Environmental Protection Agency's (EPA) response to public comments) were reviewed and a literature search

for research related to the RFS was conducted.

- iv. In addition, officials at EPA, the Department of Energy (DOE), and the Department of Agriculture (USDA) were interviewed. Congressional Research Service officials who have conducted extensive work on the RFS were also interviewed.
- v. To provide expert views on actions needed to address these challenges and meet the goals of the RFS in the future, content analysis of the experts' responses, which identified possible actions within the current RFS structure, changes to the RFS structure, and through policy alternatives to the RFS were used.
- vi. This report also drew from a companion report, GAO-17-108, that examined federal research and development in advanced biofuels and related issues.

### Major Findings:

1. The RFS is expected to fall short of its targets, because of limited production of Advanced Biofuels and limited potential for expanded production by 2022 which has resulted in reliance on Conventional Corn Starch Ethanol, which achieves smaller greenhouse gas emission reductions compared with advanced biofuels. Given current production levels, most experts stated that advanced biofuel production cannot achieve the statutory targets of 21 billion gallons by 2022. The shortfall of advanced biofuels is the result of high production costs, despite years of federal and private research and development efforts. According to several experts, the investments and development required to make these fuels more cost-effective, even in the longer run, are unlikely in the current investment climate, in part because of the magnitude of investment and the expected long time frames required to make advanced biofuels cost-competitive with petroleum-based fuels.

2. The RFS has relied on Corn-Starch Ethanol, which in higher blends is incompatible with existing infrastructure and offers comparatively small greenhouse gas reductions. Reliance on adding more ethanol to the transportation fuel market to meet expanding RFS requirements is limited by the incompatibility of ethanol blends above E10 with the existing vehicle fleet and fuelling infrastructure.
3. Experts suggested following federal actions that could incrementally encourage investment in advanced biofuels and increase compatibility of infrastructure with higher ethanol blends:
  - i. Addressing uncertainty about the future of the RFS: Many experts stated that uncertainty about the future of the RFS is limiting investment in advanced biofuels.
  - ii. Providing more consistent subsidies to advanced biofuel producers: Some experts stated that the Second Generation Biofuel Producer Tax Credit—an incentive to accelerate commercialization of fuels in the advanced and cellulosic biofuels categories—has expired and been reinstated (sometimes retroactively) about every 2 years, contributing to uncertainty among cellulosic fuel producers and investors. These experts stated that investment in cellulosic biofuels could be encouraged, in part, by maintaining the Second Generation Biofuel Producer Tax Credit consistently, rather than allowing it to periodically lapse and be reinstated.
  - iii. Expanding the types of fuel that qualify for the RFS: The current RFS framework specifies that qualifying biofuels must be derived from biomass-based feedstocks. According to some experts, this excludes some types of low carbon fuels from qualifying under the RFS.
  - iv. Reducing Renewable Identification Numbers (RIN) fraud and price volatility: EPA’s responsibilities for the RFS also include determining companies’ compliance with the RFS. EPA regulates compliance with the RFS using a credit system. Companies in the United States that refine or import transportation fuel must submit credits—called renewable identification numbers (RIN)—to EPA. Companies with such an obligation are known as “obligated parties.” Since biofuels supply and demand can vary over time and across regions, a market has developed for trading RINs. If a supplier has already met its required share and has supplied surplus biofuels for a particular biofuel category, it can sell the extra RINs to another entity or it can hold onto the RINs for future use. An obligated party that faces a RIN deficit can purchase RINs to meet its obligation. Some experts said that a lack of transparency in the RIN trading market has led to an increased risk of fraud and increased volatility of RIN prices.
  - v. To increase compatibility of infrastructure with higher ethanol blends several experts suggested that expanding grants to encourage infrastructure improvements, such as USDA’s Biofuel Infrastructure Partnership, could increase both the availability and competitiveness of higher blends at retail stations nationwide..
4. Experts suggested policy alternatives that could more efficiently reduce

greenhouse gas emissions: Several experts stated that the RFS is not the most efficient way to achieve the program's goal of reducing greenhouse gas emissions, and they suggested policy alternatives—in particular, a carbon tax and a low carbon fuel standard (LCFS). Under a carbon tax, each fossil fuel would be taxed in proportion to the amount of greenhouse gas (carbon dioxide) released in its combustion. Some experts stated that the RFS does not incentivize the production of advanced biofuels, which achieve the greatest greenhouse gas emission reductions. For example, a cellulosic fuel that reduces greenhouse gas emissions by 80 percent receives no more credit under the RFS than one that reduces greenhouse gas emissions by 60 percent, the baseline for the cellulosic category. One expert stated that the RFS design creates a market rebound effect. That is, increasing the supply of biofuels tends to lower energy prices, which encourages additional fuel consumption that may actually result in increased greenhouse gas emissions. Several experts said that an LCFS would be more flexible and efficient than the RFS at developing biofuels that achieve the greatest greenhouse gas reductions. Specifically, an LCFS compares cost with greenhouse gas intensity (by accounting for carbon on a cost per unit of carbon intensity), thereby supporting incremental carbon reductions. An LCFS can be implemented in one of two ways. The first involves switching to direct fuel substitutes (e.g., drop-in fuels) or blending biofuels with lower greenhouse gas emissions directly into gasoline and diesel fuel. The second involves switching from petroleum-based fuels to other alternatives, such as natural gas, hydrogen, or electricity, because a low carbon fuel standard would allow a wider array of fuel pathways than the RFS. Under the first scenario, an LCFS would promote

biofuel usage, rather than incentivizing electrification of the light-duty vehicle fleet. As a result, according to some experts, an LCFS is preferable to a carbon tax because it more efficiently reduces greenhouse gas emissions and promotes the expansion of the biofuel sector.

### Significance:

- i. This report covers policy implemented by world's biggest emitter of green-house gases to reduce emission of greenhouse gas emission and can play an important game-changer in the form of inputs for reforming the policy to make it more efficient and effective.
- ii. Audit methodology includes innovative method of consultation with experts from industry, academia, and research organizations identified by National Academy of Sciences. Views of experts has been categorised while reporting based on number of experts having a particular response.
- iii. Experts views on Complex technical / scientific issues which can make programme more efficient and effective has been incorporated in the report.
- iv. Report includes suggestions for the executive on federal actions that could incrementally encourage investment in advanced biofuels and increase compatibility of infrastructure with higher ethanol blends. Report also suggests policy alternatives that could more efficiently reduce Greenhouse gas emissions.

➤ **Anupam  
srivastava &  
Vijendra Singh  
Tanwar**

## X. Glass facade: A concept needs to be re-looked

The trend of glass facade has increased at the world-wide level in the recent decades. Due to the globalization and imitation of western society, this trend has also increased in developing countries like India. Further, in the 90s the policy changes in India, viz Economic Liberalization, Privatization, IT revolution etc. have also accelerated the pace of urbanization. During this state of urbanization, the construction industry has developed at a rapid pace, so as the conscious demand for sustainable building materials. Since the glass provides designers with fascinating creative options, the popularity of the material has increased over the last few decades.

### Advantages of glass structures

As we know Glass is a far lighter material than concrete or wood, and so the weight of the building is reduced by using glass. This leads to lesser stress on the building and its foundations. Use of glass also allows outside greenery and natural beauty to be enjoyed inside the building and it ensures a better working environment. Further, Glass can be easily manufactured and installed in lesser time compared to other conventional materials like cement or steel. Basically, Glass is now a protective sheath that protects occupants of a building from heat, noise, fire, and even from dirt and grime through self-cleaning properties.

### Green Building Rating Systems

To evaluate the performance of a building and its impact on the environment in India, there is a tool like green building rating system. At present there are three rating systems in our country - Leadership in Energy and Environmental Design (LEED), the rating system from Indian Green Building Council (IGBC) and the Green Rating for Integrated Habitat Assessment (GRIHA). In addition there is also the Energy Consumption Building Code (ECBC) and the National Building Code (NBC) which provide guidelines on energy consumption.

The Energy Conservation Building Code 2007 (ECBC) of India has prescriptive standards for use of glass. The code allows a maximum limit of 60% of glazed area, but 40% is the recommended optimum upper limit. The ECBC then goes on to define the insulation and energy efficiency specifications of glass. Double-glazed or triple-glazed glass, which is solar reflective, is preferred since it provides superior thermal performance. GRIHA the indigenously developed rating system by TERI with support from MNRE has very effectively integrated the ECBC requirements. A GRIHA compliant building cannot exceed prescriptive glazing requirements of ECBC and GRIHA also mandates compliance with stringent energy performance benchmarks and day lighting provisions.

### Problems associated with glass facades

Though, these glass structures come up very quickly and are also cost effective, other than looking good, such buildings are a major cause for higher consumption of electricity. Since the glass is transparent, higher amount of infra-red radiation comes in. They are short wave radiation when they enter, but the moment it enters the room it becomes long-range radiation. Hence, a higher capacity air-conditioner is required to keep the indoors cool.

Glass buildings are a very European concept because those countries are cold and they don't get sufficient sunlight. Hence, their main aim is to get maximum sunlight. But, in our country where temperatures at times go as high as 50 degrees Celsius, these glasses take in more of sunlight. Further we have to deal with the high glare. For example, Delhi receives 2,688 hours of sunlight annually as against London that receives only 1,480 hours of sunlight in a year. Basically, India is situated above equator and the line of Tropic of Cancer passes through it. This makes sun's rays incident on India at an angle near to 90 degrees. As perpendicular rays fall on India they make it hotter than slant rays would. As we know that the glass attracts heat and prohibits heat from escaping from indoors and makes the interior hot. Hence, the offices use more air-conditioners resulting higher consumption of electricity and emission of

carbon-dioxide and CFCs that harm the ozone layer.

Further, glass is also not an environment-friendly material. It consumes high amount of energy right from its manufacturing to transportation and installation. The embodied energy of glass is between 15.9 and 26.2 mega joules per kg whereas it is 1.06 MJ/kg for bricks. The embodied energy of glass increases considerably when used as double or triple glazing or when inert gases like argon replace the air gap to further improve performance. A report (2012) by the National Environmental Engineering Institute (NEERI) said that the temperature around a glass-facade building can go up by 17 degrees Celsius. Further, a study by IIT-Delhi in the national capital city, Jodhpur and Chennai found that energy use increases with the increase in glazed area, irrespective of glass type, climate or orientation of the building. For instance, glazing on the northern wall of a building allows the least gain in heat as compared to any other facade orientation. But if the glass wall covers more than 20 per cent of the south-facing facade, the building overheats even in winters.

Though many feel that once we provide glass in a building façade, we are free from painting expenses for ever but this is not fine. We may have to spend equally for cleaning of glass. Sometimes it is as costly as expose painting. Again, we may paint building once in a 5 years but for glass we have to clean every year.

### Required Solution

It is evident from the above fact that “Glass is not so Green”. Instead of innovating designs to suit local conditions, identical glass buildings are being built. Building designers are using larger and larger areas of glass in facades, which does not exactly promote energy efficiency. Also, there are no such rules & regulations exist in the country at present which restricts the quality and quantity of the glass in new constructions.

As the present world is struggling between the theory of “limit to growth” and “growth has no limit”. In the same manner, the environmentalist vocals for stoppage the use of

glass for construction purpose; whereas the construction designers-builders-real estate developers and other wants to use glass as a key component in their constructions. Therefore, in this scenario, the planning and execution of such facades requires utmost care. The solution for a more sustainable use of glass materials in Indian structures involves certain regulations concerning usage of safety glazing with tempered and laminated glasses. Some common tips for opening / glazing selection or design are suggested as follows:-

- A building should be properly oriented so that most areas that require day lighting are facing towards north or south (in northern hemisphere).
- the east and the west should be properly shaded
- Window-wall ratio should be determined on daylight requirements of adjoining spaces and also as per ventilation requirements.
- U-factor and SHGC (solar heat gain coefficient) for a fenestration product (including the sash and frame) should be low for a hot climate, and the visible light transmittance should be high.
- Shading devices such as chajjas, vertical / horizontal projections should be used to control glare.

➤ **Mukesh Kumar Lal,**  
**Director, PDA(C),**  
**Ahemdabad**

## XI. My Incredible India Experience

As the Chinese saying goes “A journey of a thousand miles, begins with a single step.” I never knew that my journey to India began the day I was recommended to participate in the 5<sup>th</sup> training on Environmental Audit to be held at the International Center for Environment Audit and Sustainable Development (iCED), Jaipur from 20 November to 2 December 2017. A

single step that changed a lot of perspective in my life.

Preparing for the course was a source of stress as I had to prepare a country paper on a lot of topics concerning the environment. I had to read up on so many things, research several subjects and look for a lot of reports and information! But life goes on, and colleagues were helpful in assisting my needs for the training and superiors supportive so I was able to complete my country paper.

At first I was communicating online with colleagues in charge of international trainings in our SAI, the Commission on Audit, Philippines. But later on, I had the opportunity to connect with iCED thru Mr. Vijendra Singh Tanwar, Assistant Administrative Officer, who, in the limited emails that went across the web, very kindly kept me updated on relevant matters.

I had a lot of misgivings about my trip to India since I was going alone and I did not know what to expect in the training but a colleague who had an opportunity to visit iCED informed me that it had great facilities. And knowing that we were to be housed in iCED took a lot off my mind. No commuting to the sessions! No problem on hotel accommodation and I was going to be fetched at the airport!

The day I had to depart for India came and I was finally in iCED! My room was spacious with all the amenities I could want in a very nice hotel room – flat screen TV, a small ref, water kettle, emergency lamp, heater, supply of coffee and tea and some snacks. The bathroom had soap, shower gel and shampoo. There was even a hair dryer! My first meal was lunch in the dining hall. Never did I expect that every meal would be like eating in a buffet in a restaurant! There was a variety of dishes with soup, salad and dessert to go with the main courses. I learned to have roti with lunch and /

or dinner and the dining hall staff were courteous and attentive.

The dining hall manager was always around to see to our needs and convenience. We were pampered during mealtimes and I always looked forward to discovering new dishes with each daily menu. Eating was so enjoyable because of the food, the staff and the people I shared meals with.

Although the Thai participant became a close friend and my regular companion during the training, we made it a point to befriend everyone and so we changed our seating places in the dining room every so often so that we were able to sit with most of our co-participants for the duration of our training.

The training sessions were held in the Academic Block where all 24 participants were seated in groups of four and to my delight, my groupmates were the participants from Thailand and Nepal whom I was already acquainted with on my first day at iCED. The fourth member was from Fiji and he was an energetic young man whom I later dubbed as Michael Jordan as he looked like the basketball star when he was clean-shaven! And for the next two weeks at iCED we were an enthusiastic and lively group eagerly participating in the seatwork and class discussions.

For the first time, in my experience and in iCED's training module we had a video conference with the resource person (RP) from Estonia, Ms. Viire Viss, on the topic Market Based Instruments in Environmental Governance. Although, it was quite difficult relating with an on-screen speaker, my co-participants did not let it bother our learning process and questions were raised as our class interacted with the speaker.

The sessions were divided into different topics related to the environment. Some topics I found interesting, others were quite novel to

me and still others a review of things learned over the years. The topic on Sustainable Development Goals (SDGs) was new to me and I found it enlightening as I realized that projects should be audited in relation to the attainment of these SDGs so that auditors can help the government assess their performance in the attainment of the SDGs.

Renewable energy was also another topic that made me realize that the Philippines had several renewable energy sources I never knew had a lot of potential. Altogether, the sessions were enjoyable and at the same time gave us much insight and knowledge on topics that enabled us to learn not only from the RPs but from our co-participants as well.

It was refreshing experiencing and learning new techniques from our RPs. We had table discussions, group works, field trips and even dancing during the sessions! New groupings would be created for seatwork and so we had lots of opportunity to interact with other participants. For our culminating activity, we were regrouped yet again and were required to come up with a Strategy Paper on assigned topics on the environment which were issues in our countries.

And a trip to India is not complete without a visit to the famous Taj Mahal! I thought I would be leaving India without having glimpsed the Taj Mahal but we were all pleasantly surprised to know that we would be having a trip to Agra! I could not contain my excitement for such a rare opportunity! Incidentally, the word Mahal in Filipino means Love. The Taj Mahal is indeed an amazing monument to love.

As all journeys have to end so did our 2-weeks go so quickly. Our last night was a celebration of India's rich culture with its music and dances. We were all happy to have finished the course and go back home and yet we were sad as we would be leaving iCED which had

become our second home in the 2-weeks we were there. We were like a big family with our own cultural differences but I did not feel any differently than being with family. We overcame our differences and enjoyed each other's company as colleagues and more importantly as friends!

The training gave me a whole lot more than I could ever imagine or hope for. I gained 23 new friends in my co-participants, not to mention the officers and staff at iCED. It was a Christmas present to cherish in my job as a civil servant and an experience to look back to with joy and fondness.

➤ **Ma. Josefina  
Susan L. Delotavo  
(ITP Participant)**

