



GREEN FILES



*Newsletter on Environment Audit and Sustainable
Development issues*

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

EDITORIAL

I am happy to present 18th issue of Green Files a quarterly Newsletter compiled by iCED.

From this volume onwards we set out to add content and extend readership through relatively wider circulation. This newsletter aims to share professional experience and information to enrich environmental auditors' domain knowledge.

Standard features like results of recent international environmental conferences, snapshots of recent news on environment, important judgments on environment issues in India as well as inclusions in recent national audit reports pertaining to environment and sustainable development, international audits conducted by other SAIs of the world are all retained. Additionally, efforts are envisaged to enrich this newsletter by including in its forthcoming issues contributions from paper presenters at seminars, presenters in training programs held at iCED, etc. **An article by Shubhangi Gupta on "Smart Cities: The Future Ahead"** in this volume is a step in this direction.

Coverage of an international audit report also undergoes an "approach shift". While giving the essence of one such report, an attempt is made to draw lessons for India from it. I do hope that readers would welcome these changes and feel a bigger connect with iCED through these changes. We extend a warm welcome to fraternity within the Indian Audit and Accounts Department to contribute articles and express views on the content and presentation of Green files. We 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

Sunil Dadhe
Director General, iCED

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I. The Second United Nations Environment Assembly of the United Nations Environment Programme (UNEA) - Held on 23-27 May 2016- Nairobi, Kenya

United Nations Environment Assembly (UNEA) represents the world's highest-level decision-making body on the environment. It enjoys the universal membership of all 193 UN Member States and the full involvement of major groups and stakeholders. UNEA thus provides a groundbreaking platform for leadership on global environmental policy. Through UNEA, the world wants to work together to build a healthier environment to support humanity for generations to come. The second United Nations Environment Assembly (UNEA) of the United Nations Environment Programme (UNEA-2) met from 23-27 May 2016 in Nairobi, Kenya. Over 2,500 delegates, including 123 ministerial-level participants from 174 countries, attended the meeting, with other registered participants including 230 representatives of business and 400 from accredited Major Groups & Stakeholders. In his policy statement, UNEP Executive Director Mr. Achim Steiner stressed the need for leadership role in the implementation of recent international agreements. He mentioned that the cost of inaction now will be huge for future generations. He urged Member States to allow for differences in priorities and objectives, and to try to find common ground. Committee of the Whole (COW) approved a number of policy matters including the UNEP

Medium-Term Strategy 2018-19, Programme of Work (PoW) and budget, and changes to the UNEA cycle. UNEP organized 26 side events and a series of roundtables and networking functions, many of them part of a Sustainable Innovation Expo, which ran in parallel to the first three days of UNEA-2. UNEA-2 clearly charted a course toward broadening its range of stakeholder engagement. The Sustainable Innovation Expo was highly praised by delegates for the interest and breadth of its events and its contribution to building stronger links with the private sector, thus laying the foundation for innovation that may be financed by non-traditional donors.

The most significant issue of substance at UNEA-2 was how large a role UNEP should play in advancing the 2030 Agenda on "Sustainable Development". The introduction of many emerging issues to the conference agenda also highlighted that Member States are taking UNEA as a policy discussion venue.

UNEA-2 successfully promoted discussion of the environmental dimension in areas of work not traditionally associated with UNEP. The symposium on "Environment and Displacement," which drew many high-level participants, pointed to environmental degradation and natural resource scarcity as important reasons behind conflict and



migration, and the resulting surge of prejudice and xenophobia in areas under pressure.

In terms of the central theme of the Assembly, approved resolutions succeeded in setting a clearer role for UNEA's work with the High Level Political Forum and other UN agencies in the implementation of sustainable development, but these roles still seem to be focused on the provision of information and scientific data. Other emerging issues included the need for investment in human capacity for sustainable development through environmental education and training, and an increased stakeholders' engagement. Additional symposia also took place on the topics of investment for sustainable development and environment and displacement.

Prominent Outcomes of the UNEA-2 Meeting

The UNEA-2 of the UN Environment Programme (UNEP) concluded with the adoption of 24 resolutions. Highlights of some of the important resolutions are as mentioned below:

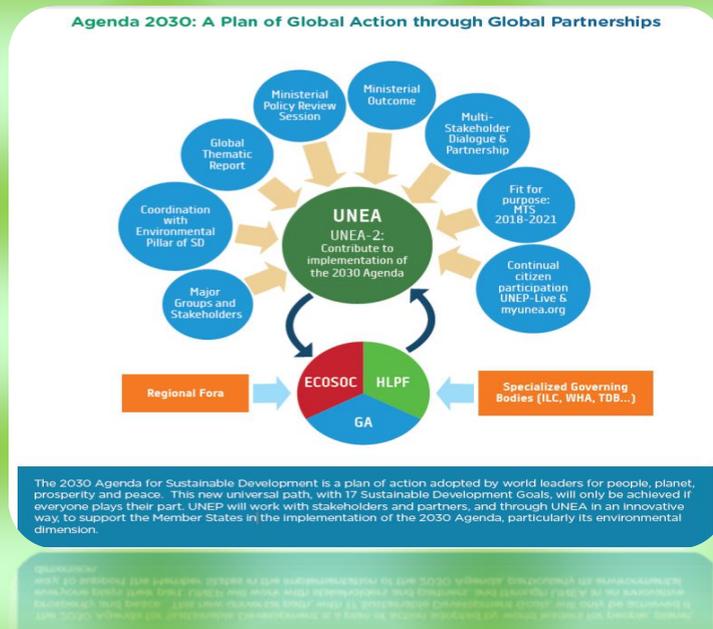
- A resolution on the protection of the environment in areas affected by armed conflict has been approved by consensus at the UNEA-2. This is being considered the most significant UN resolution of its kind since 1992. This new resolution reflects not only a deeper understanding of the

environmental implications of armed conflict throughout the conflict cycle but also growing international interest in finally tackling the weak state of legal protection for the environment and the inadequate systems of environmental response and recovery. The resolution stresses the need

to protect the environment in conflict and for its restoration following conflicts. It also emphasizes the need to raise awareness of wartime environmental damage – to challenge the notion of the

environment as the silent victim of conflict. States are also urged to cooperate closely on minimizing and mitigating environmental harm.

- The resolution on illegal trade in wildlife was adopted containing the important role that the conservation and sustainable use of wildlife can play in the achievement of the 2030 Agenda and in addressing illegal trade and trafficking in wildlife through the development of sustainable and alternative livelihoods for affected communities.
- In a resolution on supporting the Paris Agreement, UNEA requests the UNEP Executive Director to contribute to the implementation of pre-2020 global efforts to address climate change through :



strengthening efforts in education, training, public awareness, public participation, public access to information and cooperation; reinforcing and stepping-up UNEP's participation in partnership programmes and initiatives; and strengthening collaboration between UNEP and other relevant stakeholders on work on adaptation, mitigation and the transition to a sustainable future in a manner that reinforces synergies, avoids duplication, and maximizes efficiency and effectiveness.

- The final resolution notes on marine litter and debris, increased knowledge regarding the levels, sources, negative effects of, and possible measures to reduce marine plastic litter and micro plastics in the marine environment, and recognizes the importance of cooperation between UNEP and the relevant conventions and international instruments. The resolution calls on governments at all levels to further develop partnerships with industry and civil society and the establishment of public-private partnerships, and to organize and participate in annual campaigns for awareness-raising, prevention and environmentally sound clean-up of marine litter.
- The resolution on the 'Roles of UNEP and UNEA in delivering on the 2030 Agenda for Sustainable Development,' commits UNEA to contributing to the effective implementation of the environmental dimension of the 2030 Agenda in an integrated manner; and to convey the main messages of its sessions to
- High Level Political Forum (HLPF) to support the Forum's follow up and review function. It also emphasizes that UNEP, within its mandate, has an important role in the

follow up and review of the progress in implementing the environmental dimension of sustainable development, including the provision of policy relevant information, through assessment processes, all of which should support the overall follow up and review by the HLPF of the 2030 Agenda.

Source:

<https://www.iisd.ca/unesp/unea2/>

<https://foreignaffairs.co.nz/2016/06/01/unea-2-adopts-25-resolutions/http://environmentalgovernance.org/>

<http://www.trwn.org/>

II. New Amendments to the Mines and Minerals (Development & Regulation) Act, 1957

The Parliament of India in 2015 passed major amendments to the Mines and Minerals (Development & Regulation) Act, 1957 (MMDRA). The amendments sought to address emergent policy and regulatory issues pertaining to the mining industry. The Amendment has come after the views and recommendations of the Shah Committee and the recent Supreme Court judgment in the case of Manohar Lal Sharma versus the Principal Secretary and Others, which cancelled all coal-block allocations since 1993, and has introduced greater transparency in the allotment of the mining leases by resorting to the auction route. Furthermore, it is an important step towards removing delays and ensuring a simpler and quicker process for granting of mineral concessions. Provisions of the Act are in line with the recommendations of the Anwarul Hoda Committee on National Mineral Policy. The Bill focuses on attracting private investment and leveraging the latest technology so as to enable expeditious and optimum development of mineral resources of the country. It brings clarity on licensing terms,

auctions and transfer of concessions. The most significant provision of the Bill is the introduction of competitive bidding process for granting new mining leases. The salient provisions of this Amendment have been:

- The grant of mineral concessions would be only through auctions, thereby bringing in greater transparency and removing discretion. It is also clearly specified that all mining leases would henceforth be granted for a period of fifty years as against the thirty years earlier. This provision shall apply to all minerals other than coal, lignite and atomic minerals.
- Bauxite, Iron Ore, Limestone and Manganese Ore are declared as notified minerals and their end use is specified by the Central Government under the newly released mineral auction rules. Accordingly, bauxite, iron ore and limestone can only be reserved for the end-use of alumina, integrated steel plants and cement plants by state governments respectively whereas a manganese mine can't be reserved for any end-use. Moreover, a two-stage auction model comprising of a technical bid initially followed by a financial bid has been proposed for them.
- There is a mandatory provision to establish a trust, a non-profit body known as the District Mineral Foundation (DMF) in all districts where mining related operations take place. The establishment of the DMF has been introduced to address the concerns of local people in such districts, and work for the interest and benefit of the locals in mining affected areas. It also specifies the contribution to the DMF of an amount not exceeding one-third of the royalty rate in case of new mining concessions, while existing concession holders may have to pay up to 100% of the royalty.
- To incentivize the exploration the Amendment has made a provision to setup a National Mineral Exploration Trust (NMET) with the objective of using funds contributed by the holders of mining leases for carrying out extensive exploration exercises. The contribution shall not exceed a sum equivalent to two per cent of the royalty rate. The composition and functions of this trust would be prescribed by the Central Government.
- Under the existing act, there were 3 kinds of licences that could be granted: Reconnaissance Permit (RP), Prospecting Licence (PL) and Mining Lease (ML). A RP is granted for preliminary prospecting through regional, aerial, geophysical or geochemical surveys and geological mapping. A PL is required for exploring, locating and proving mineral deposits. An ML is required to finally extract minerals. The Amendment creates a new category of Mining Licence i.e. the prospecting licence-cum-mining lease (PL-cum-ML) referred to as the Composite Licence, which is a two stage-concession for the purpose of undertaking prospecting operations (exploring or proving mineral deposits), followed by mining operations.
- Some provisions have also been added to remove pendency of applications for renewal so as to give impetus to the mining sector. Provision has also been made to allow transfer of mining leases, after securing the requisite approval from the State Government. The procedure has been simplified to some extent by avoiding delay. All offences under the Act will now

be subject to a maximum punishment of 5 years imprisonment or fine of ₹ 0.50 million per hectare. These are the penalties which can now be levied for illegal mining. State Governments are also empowered to set up Special Courts for speedy trial of offences under the Act.

The Amendment Act is in line with the vision of the Ministry of Mines to promote optimal utilization of India's mineral resources for its industrial growth and create economic surplus using scientific exploration and sustainable mining practices. It lays down a comprehensive legislative framework to ensure a fair and transparent manner of allocation, while safeguarding the interests of the local community and people affected by mining activities. The mineral rich states would benefit from the increased revenue and livelihood opportunities.

- A major criticism against the amendment has been that it gives overarching power to the Centre over states. However, the positive side of it would be that there is a common framework across the states. The states are responsible for actual implementation and would be ensuring real implementation.
- Concerns were also raised about the fund disbursement mechanism of DMF. It was also argued that though the highest limit on the sum of money that a mine lease holder is required to pay (not exceeding one-third of the royalty for all respective minerals) to DMF has been specified, there is no lower limit. However, the rules in this regard are to be framed by the state government and the same may put such lower mandatory limits.
- This is evident from the provisions for checking illegal mining only through

increasing fines and creating of courts; there is no mention of institutional strengthening required to deter companies from violating the law.

Significance for auditors

- The biggest concern of auditors about transparency in procedure regarding allocation of natural resources has been taken care of by this amendment. The actual implementation of the policy can be seen in field and the controls in this regard can be assessed in future audits.
- There are two statutory funds created by the amendment and the rules in that regard are yet to be framed by the Central Government for NMET and various state governments for their respective DMFs. The CAG might be entrusted the audit of these funds. The compliance in the form of creation of these funds and subsequent compliance of the rules made for their operation would be areas of interest for public auditors as the spirit of these funds are important for sustainable development in the mining sector of India.

Source:

<http://www.swaniti.com>, <http://www.downtoearth.org.in>

III. Environmental Case Law

The matter of Sunil Kumar Chugh v. Secretary, Ministry of Environment and Forests, New Delhi, Appeal No. 66 of 2014

The boom in India's economic growth fuelled by large scale immigration has resulted in mass urbanisation on a large scale as millions of people seek better economic opportunities. However, this economic growth has come at a tremendous cost to the quality of human life as unplanned urban developments have mushroomed, giving rise

to pollution, congestion and diseases that give rise to living conditions that would be termed "miserable" by western standards. One of the prime reason for this dismal state of affairs is illegal construction. Developers blatantly violate Development Control Regulations (DCR) that stipulate mandatory open spaces, recreation grounds, parking and fire safety. Some of the municipal officials look the other way and consequently, the right to life of citizens gets compromised. To make matters worse, enforcement of DCR was considered a municipal matter and not as one falling within the scope of the term "environment".

The principal bench of the National Green Tribunal (NGT) at New Delhi passed a landmark judgment that, for the first time, brought important principles of town planning within the scope and jurisdiction of the NGT. In its judgment, the NGT held that open spaces, recreational grounds and adequate parking facilities in buildings had an important bearing on the Right to Life of people.

The appellants, Sunil Kumar Chugh and Ravinder Khosla, were residents of the slum redevelopment project being carried on by the developer, M/s Priyali Builders at Antop Hill, Mumbai. They filed an appeal challenging the Environmental Clearance (EC) issued to the developer on March 25, 2014 as illegal and prayed that the same be quashed. The land, which was encroached by slums, was reserved for a municipal office and road when the builder submitted a proposal to the SRA to rehabilitate 324 tenements in 1997. Five years later, the builder got the first Letter of Intent for 14,600 M² built-up area and was later granted permission for more construction, which the tribunal was told

exceeded 20,000 M² attracting a prior Environment Clearance. In their appeal, the appellants stated that the builder had violated the Environmental Impact Assessment Notification, 2006 by starting construction without EC, way back in 2009. For five years, the developer continued construction without EC. The State Environmental Impact Assessment Authority (SEIAA) of Maharashtra ignored this blatant violation and blindly granted EC to the builder.

It was further averred by the appellants that the developer did not provide any recreation ground to the residents. Further, he did not provide any parking spaces for the residents of the rehabilitation tenements, as a result of which, they were forced to park on the street. This severely prejudiced their Right to Life under Article 21 of the Constitution of India.

In its judgment, the NGT held that the developer had violated the EIA Notification, 2006 and the Environment Protection Act, 1986 by commencing construction without prior EC. Further, by not providing adequate recreation grounds, the developer had severely prejudiced the Right to Life of the appellants. Consequently, the bench held the developer liable for violating the law and imposed a fine of ₹ 30 million to be paid into the Environmental Relief Fund maintained under the Public Liability Insurance Act, 1991. Further, taking note of the fact that the developer had provided deficient recreation grounds to the residents, the court directed that a further sum of ₹ 3.26 million be paid to the Maharashtra Pollution Control Board (MPCB) for the deficient recreational area in the building. The approved plan of the building was quashed and the builder was directed to submit a fresh plan that would

contain adequate parking for all residents of the building and address the shortfalls. The tribunal said that the developer must modify the building plans and get them approved for additional parking space in the building from the seventh storey upward to make parking space available for both the rehabilitation building and the sale building.

The builder said the SRA had permitted reduction in the amenity area to 8% and allowed the recreational area above the podium level. But the tribunal observed that the SC held that "right to clean and healthy environment is within the ambit of Article 21 (Right to Life) and that open land around a building can only be at the ground level, not podium".

During the court proceedings, the developer had claimed that prior EC was not required as the FSI Area of the project was less than 20,000 M², the prescribed statutory limit. He claimed that the lift lobby and staircase area were exempt from the computation of built-up area under the EIA Notification. The NGT strongly rejected this argument, stating that the term "built-up area" includes the entire construction area, saleable and non-saleable. It further held that the 2011 amendment to the EIA Notification that clarified the term "built-up area" was clarificatory in nature and would have a retrospective effect from 2006 itself. The judgment pronounced that the term built-up area includes both FSI (Floor Space Index or Floor Area Ratio) and non-FSI areas. In this case, the built-up area was 30,000 M², which included over 12,000 M² of non-FSI area. This will help end the practice of builders trying to separate the two to evade Environment Clearance. The booming construction industry in Mumbai has resulted in repeated violations of environmental

norms that severely prejudice the Right to Life of the residents. Innumerable projects commence construction without prior EC. Ex-post-facto clearances have been granted arbitrarily, without imposing any penalty on the developer. The landmark judgment of the NGT in the case will set a strong precedent in penalising violators and quashing the illegal permissions granted to them. Further, builders will not be able to segregate FSI areas from non-FSI areas and pass off the same as built-up area. This ruling is indeed an important step forward in the effort to save India's cities from the degrading effects of illegal construction and haphazard urbanisation, which have so far continued unabated. The judgment represents the first time that municipal issues such as parking spaces, recreation grounds and fire safety were brought within the scope of environment jurisdiction.

IV. Environment News

1. Environment Ministry Notifies Hazardous Waste Management Rules, 2016.

The new Hazardous Waste Management Rules 2016 are notified by Government of India to ensure resource recovery and disposal of hazardous waste in environmentally sound manner. The Rules are environment and industry- friendly. They are applicable to hazardous waste generated during the manufacturing processes of the commercial products such as industries involved in petroleum refining, production of pharmaceuticals, petroleum, paint, aluminium, electronic products etc. As per the information furnished by Central Pollution Control Board (CPCB) in the year 2015, the total hazardous waste generation in the country is 7.46 million metric tonnes per annum from about 44,000 industries.

1. Solid Waste Management Rules Revised After 16 Years; Rules Now Extend to Urban and Industrial Areas'

The Union Ministry of Environment, Forests and Climate Change recently notified the new Solid Waste Management Rules (SWM), 2016. These will replace the Municipal Solid Wastes (Management and Handling) Rules, 2000, which have been in place for the past 16 years. According to the government 62 million tonnes of waste is generated annually in the country at present, out of which 5.6 million tonnes is plastic waste, 0.17 million tonnes is biomedical waste, hazardous waste generation is 7.90 million tonnes per annum and 1.5 million tonnes is e-waste. He added that only about 75-80 per cent of the municipal waste gets collected and only 22-28 per cent of this waste is processed and treated.

2. Scheme for Distribution of Energy Efficient Smart Agriculture Pumps launched

In order to make country more energy efficient government has launched two schemes namely National Energy Efficient Agriculture Pumps Programme. This Scheme will be implemented by Energy Efficiency Services Limited (EESL), a JV of PSUs under Ministry of Power. National Energy Efficient Agriculture Pumps Programme will help farmers in replacing energy guzzlers age-old agricultural pumps across the country with the new-age energy efficient agricultural pumps, with a 5-Star Rating. These pumps will come enabled with smart control panel and a SIM card, giving farmers the flexibility to switch-on and switch-off these pumps from their mobile phones and from the comfort of their homes.

3. Centre Extends ₹. 800 Crore Assistance For Cleaning Lakes in Bengaluru

India has urged the developed world to declare its enhanced action plan for the second period of Kyoto Protocol. On the issue of pollution of lakes in Bengaluru, the government has issued directions under section 5 and section 18 of Environment Protection Act on pollution of lakes in Bengaluru. Centre has extended an assistance of ₹ 0.80 billion under AMRUT scheme for cleaning up the lakes in Bengaluru. Out of this, ₹ 50 million is for laying down a 74 Km trunk sewage pipeline and ₹ 16.2 billion have been provided to construct 4 Sewage Treatment Plant (STPs) in Bellandur lake. Ministry said that 1280 MLDs of sewage is generated per day in Bengaluru, while the capacity to treat sewage is 721 MLD. Out of this, 600 MLD of sewage is actually treated and 137 STPs are non-functional.

4. Eco Friendly Jute Bag initiative in Delhi- Mother Dairy to offer jute bags to customers at all Mother Dairy/Safal outlets in Delhi – NCR

Indiscriminate use of polythene bags is one contributor to the pollution problem in the national capital. The National Green Tribunal (NGT) has on multiple occasions, tried to ban use of plastic carry bags in Delhi. However, we find these plastic carry bags continue to be used commonly. Residents of Delhi now have a choice and can themselves restrict use of plastic bags by using eco-friendly, biodegradable and low-cost jute bags. Mother Dairy, National Jute Board (NJB) and Birds Jute & Exports Ltd. (BJEL) have joined hands in this green venture, to provide attractive, low cost jute bags at the thousand-odd booths of Mother Dairy / Safal in Delhi.

5. Promotion of Bio-Fertilizers. Government is promoting bio-fertilizers through various schemes for agricultural development. Presently, the project is being implemented in

20 centers located in state covering 16 States. Organic farming package of practices for 18 crops / cropping systems have been developed. Besides, under ICAR's Network project on Soil Biodiversity-Bio-fertilizer has developed improved and efficient strains of bio-fertilizer specific to different crops and soil types. Liquid Bio-fertilizer technology with higher shelf life has also been developed. The Council has developed technologies to prepare various types of organic manures such as phosphor compost, vermicompost, municipal solid waste compost, bio-enriched compost etc. from various organic wastes. The ICAR also imparts training, organizes Front Line Demonstrations (FLDs) to educate farmers on all these aspects.

6. Government Orders Energy and Fire Audit of all Establishments of the Ministry across the country.

Environment Ministry plan for an Energy and Fire Audit of all establishments of the Ministry across the country. After the massive fire destroyed the National Museum of Natural History, Centre said that it will undertake energy and fire audit of all its 34 museums across the country while it also plans to construct a new museum in the national capital.

7. Plantation of trees along Ganga River.

The Government has planned to plant trees all along the Ganga covering 5 basin states namely; Utrakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal under the "Namami Gange" programme. Forest Research Institute (FRI), Dehradun has submitted a DPR on Forestry Interventions for Ganga (FIG) to the government in two volumes. The draft DPR has projected a financial outlay of ₹ 22937.30 million and a 5-year implementation.

8. Government to set up a pool of capital to Fund Research on Green Energy Technologies

With more and more energy efficiency coming to the fore, the demand curve of electricity in most of the developed world is either flat or showing a downward trajectory. Whereas, India's electricity consumption is going to quadruple from about 1.1 trillion units to about 4 trillion units by 2030. Government still see a possible 10% jump in the electricity growth annually for the next 15 or 16 years. India has set a target of setting up 175 gigawatt (GW) of renewable energy generation capacity by 2022, out of which 100 GW is to come from solar. Target of solar power capacity, presently at 6.7 GW, will touch 20 GW by next year.

9. Environment Ministry to sustain cleanliness campaign in National Parks, Wildlife Sanctuaries and Zoos throughout the year

Ministry of Environment, Forest and Climate Change decided to organize its theme campaign of Swachchhata in National Parks, Wildlife Sanctuaries, Tiger Reserves and Zoos, where lakhs of visitors, especially youth and children come. The Protected Areas (PAs) are spread over approximately 1.61 lakh sq. km and about 3.2 million visitors come annually to the Tiger Reserves alone. Delhi Zoo has about 2.5 million visitors annually. Though cleanliness is a standard management practice for PAs and MoEF & CC extends assistance to States on this aspect also, as per the Action Plans proposed by the States, the campaigns were designed to focus on sensitizing the visitors and tourists on issues such as solid waste management, prevention of littering and overall cleanliness of the park and surrounding areas.

V. iCED News- 7th Foundation Day



“Well begun is, half done” is an apt description of the journey of International Centre for Environment Audit and Sustainable Development (iCED). iCED, Jaipur completed its Six years of journey on 01 June 2016 charting a number of achievements after its humble beginning six years back at New Delhi in the year 2010. The new campus of iCED in Jaipur was inaugurated by Honorable Vice President of India on 05 May 2013.

The service rendered and achievements made by iCED during successive six years were remembered on 1st June 2016 on the occasion of its 7th Foundation Day.

Foundation Day Workshop

On occasion of 7th foundation day a Workshop on Capacity Building for “Environment Audit and Sustainable Development” was organized. The workshop had been planned in four sessions. Morning sessions (Session I & II) were mainly focused

on issues concerning auditing of sustainable development and Environmental initiatives for smart cities. Afternoon sessions (Session III & IV) were participatory and had open discussions for the participating young IA&AS officers, invited guests and students / faculty / researchers from Universities in the vicinity of Jaipur.

Opening of the Workshop

Sunil Dadhe, Director General, iCED welcomed Shri Nand Kishore, Additional Deputy CAG who was the Chief Guest for the day. Director General expressed gratitude to the chief guest for sparing his valuable time for attending the function and recollected, Mr. Nand Kishore’s association with iCED as past Director General and his valuable contributions to the institution. He spoke about the evolution of iCED and its achievements in preceding years. The inauguration of the workshop was attended by iCED staff in addition to the nominated

young officers of Indian Audit and Accounts Service. Ms. Rebecca Mathai, Director General of Audit, Ordnance Factories Board and Ms. Nameeta Prasad, Accountant General (E&RSA), West Bengal past Principal Director and Director of iCED respectively were also present for the function. Shri Jahangir Inamdar, Director (T&R) anchored the inauguration ceremony.

Chief Guest's Words

Shri Nand Kishore, Additional Deputy CAG noted that in a small time of six years iCED has made a decent start and remarkable progress in area of capacity building for Environment Audit and Sustainable



Development. He conveyed his good wishes for forth-coming 6th Seminar on Environment Auditing and 5th working meeting of ASOSAI WEGA to be held at iCED in October 2016. He also appreciated National and International training facilities / programmes being conducted by iCED for capacity building in the area of Environment Audit since its inception. He expressed confidence that, as result of training programmes conducted by iCED, quality audit reports on environment will come in future from field offices. He remarked that training programmes will help C&AG of India in creation of an army of Public Auditors in the field of environment audit. He concluded his speech hoping that team iCED will go towards excellence and achieve national and international acknowledgement.

Morning Session

Morning session commenced with a presentation on "Natural Resources: Conservation, Development & Sustainability"



by Ms. Nameeta Prasad, Accountant General. Her presentation emphasised the importance of the

relation between natural resource conservation, modern development and sustainability. She discussed about estimation of social and financial costs of environmental damage i.e. Air and Water. She also discussed basic sustainability concepts and the globally accepted 17 Sustainable Development Goals (SDGs). Moreover, she highlighted the importance of good governance / management in long term for conservation of natural resources.

Ms. Rebecca Mathai, Director General who chaired the discussion elaborated the challenges in audit of Environment and Sustainable Development. She discussed issues involved in analyzing Real Time Data during Environment Impact Assessment, etc. She explained need for capacity building to attain skills to examine the collected data and construction of ability for using it for taking up audits on EIA. She cited, the initiatives of iCED as a member of INTOSAI-WEGA and its contribution towards research paper on Greening of SAI's.

Afternoon Session

Afternoon session was an interactive/participative session for students of Universities in the vicinity of Jaipur. iCED structured the session to provide an opportunity to university students to be the

part of 7th Foundation Day Workshop and showcase their ideas and presentation on the topics of 'Challenges for Environment Governance in Indian Cities', 'Smart and Sustainable Cities for future India' or any other relevant topic. The primary idea behind the session was to exchange ideas and views in the area of environment and sustainable development with participants of invited universities.

iCED's Initiative to involve the academic institution was whole heartily welcomed and positively responded by the institutions. Four universities viz. AMITY, NIMS, Vivekananda Global University and Mahatma Jyoti Rao Phoolke (MJRP) University were shortlisted to make their presentations in third session. A total number of twenty five students /researchers participated along with their faculty members. Following three presentations were made.

Dr. Vinod Gaur, Assistant Professor, Amity University presented detailed made a presentation on *Mitigating Climate Changes through Biotechnological Intervention*. Dr. Gaur's presentation was focused on the Green House Gases (GHG) emission and global warming. He suggested that bio-fuel extracted from some of the local trees / plants shall be an alternative to fossil oil and it can mitigate the GH effect. He shared a study on *Balanites aegyptiaca* a local plant seeds of which can be used for extraction of biofuel.

Dr. R. Sanjeevi, Assistant Professor, Department of Environment Science, NIMS University made a presentation on *Retrofitting with integrated waste management for renewable energy system in smart cities of India*. Presentation focused on elements like

clean and green technologies, smart Environment Management Systems, environmental education, and application of Geographical Information System (GIS) for making of sustainable



smart cities. He established importance of 4P's: Public-Private-People-Partnership to hold the environmental, economic and social resources sustainable for future generation.

Mr. Ravi Kant Pareek, Assistant Professor, Vivekananda Global University underlined the problem of overcrowding of cities and its impact on infrastructure.



He advocated, why smart cities is a need to handle issues like global warming and climate changes,

to prevent resource depletion, to prevent adverse impact of increasing urbanization, to accommodate the changing lifestyle and develop the long term approach towards achieving sustainable development.



The presentations were followed by open house which was jointly chaired by the Director General, iCED and Pro Vice Chancellor of AMITY University Prof. S.L. Kothari. The young IA&AS officers, and Students /

researchers / faculty from the universities participated in the interaction which was very constructive and encouraging.

Last session (Session IV) of the workshop was in two parts, first part apportioned to nominate IAAS officers present their views through presentations on assigned topics viz. *Environment Governance in Indian Cities* and



Smart and Sustainable Cities for future India. Second part of session was a panel discussion and interaction with

Director General, ICED, Director General, Ordinance Factories Board and Accountant General (WB).

Shri Ajay Jha Dy. AG made a presentation on Audit Issues of Smart and Sustainable Cities. He described the Essential Features for Area



based developments for smart and sustainable cities. He elaborated the Necessity of Audit Standard Checklists for carrying out qualitative

environmental audits for examine the enforcing standards and regulations, evaluating data on waste generation, check out capacity development of workers and planners through standard training modules, measures for public information awareness and education programs, Identify and scrutinize the financial mechanisms, economic instruments and cost-recovery systems.

Subsequently, **Ms. Shubhangi Gupta, Dy. Director** made her presentation on Smart and

Sustainable Cities for Future India. She briefly discussed the core system for Smarter City Assessment in presentation. She described location base Smarter City Assessment Tool and tools to 'measures' cities' and its performance against applied indicators for Smarter City systems.



An article based on the content of her presentation is included in this Newsletter. (Page 31)

Both presentations were very resourceful and appreciated by participants of the workshop with applause. After the presentations of IAAS participants the session was opened for plenary. During the discussion participants form universities also raised questions mainly on type and procedure of Audit being conducted by CAG of India. The methodology adopted for environment audits by CAG, etc.

Closing Ceremony



The captivating speeches by the Chief Guest and Director General ICED inspired the young minds which

were the prominent group of participants. This was a perfect combination of a young institution and young stakeholders. The workshop thus achieved its objectives and turned out to be a great experience for ICED. The day culminated with high Tea for the participants and retired and serving IAAS officers from Jaipur. Shri M S Shekhawat senior-most among retired IAAS officers at Jaipur appreciated the infrastructure and working of ICED.

Memories window of the day



News regarding need based training programs conducted at iCED

International Centre for Environment Audit & Sustainable Development (iCED) as a training facility for capacity building on environment audit and sustainable development issues has always strived to



synergize training activity with audit activity in the department so that department can reap maximum benefits out of training programs conducted at iCED. While preparing Training Calendar for the year 2016 – 17, inputs were taken from Annual Audit Plan and Training Needs Analysis conducted by iCED to include training programs on topics/ issues being audited by field offices. In this regard, three need based National Training Programs (NTPs) were conducted in first quarter of 2016 – 17 apart from other regular training programs as follows:

a. Participants for the NTP on Flood Management were from offices presently conducting



Performance Audit on Schemes for Flood Control and Flood Forecasting.

28 officers participated in this training programme. Flood forecasting, Prevention and Planning and implementing Schemes for Flood Control, Dam Safety and Emergency Action Plans, Morphological study of Brahmaputra (focus

on GIS and RS), River Training Works, Ecological Management of Rivers in India, Structural (Designs and quality) issues in Flood Control/ Management structures etc. were some of the important sessions in this training.

b. Participants for the NTP on Environment Management in Indian Railways were from various Railway Audit offices engaged in Performance Audit of “Management of Water in Indian Railways” and Theme based audit on “Development and induction of Bio- toilets in passenger coaches in Indian Railways”. 32 officers participated in this training programme. Participants learnt about Energy, Water and Waste Management in Indian Railways as well as Sustainable Environment Management Initiatives in Indian Railways such as use of alternative fuels in Indian railways and Induction of Bio-Toilets in passenger coaches of Indian Railways.

c. Participants for the NTP on Audit of Coastal Ecosystems, Wetlands and CRZ were from audit offices located in



coastal states of India. 22 officers from offices of coastal states participated in this training programme. They were provided inputs on Coastal Regulation Law in India; CRZ Clearances: Issues in processing and Monitoring; Integrated Coastal Zone Management; Mangroves – Environmental, Legal Issues; Inventorying, Mapping and Monitoring the coastal ecology / areas through GIS and Remote Sensing Case Study of Karnataka; Conservation of coastal life /

Coastal and Marine Protected Areas; Social and livelihood issues in Coastal Zone Regulations; etc.

VI. State in Focus- Himachal Pradesh

Himachal Pradesh with an area of 55673 sq. Km is one of the smaller states of India, it ranks 17th in terms of area. Himachal Pradesh has a total population of 6,856,509 as per the provisional results of the Census of India 2011. This is only 0.57 per cent of India's total population, recording a growth of 12.81 per cent. The state took its name Himachal from the Himalaya. The territory of the state is mountainous, except for a few pockets bordering Punjab and Haryana, which have a sub-mountainous topography. Altitude in different areas ranges from 350 to 7000 metres above the mean sea level. Wide differences in geo-physical features account for considerable variation in the climate and rainfall of different sub-regions of the state. Five perennial rivers-Sutlej, Beas, Ravi, Chenab and Yamuna flow through the state. These rivers provide ample scope for generation of hydel power.

Source:

http://planningcommission.gov.in/plans/stateplan/sdr_hp/sdr_hpch1.pdf

(1) Environment Scenario

(a) Forests

As per Government of India's Forest Survey Report 2015, total recorded forest area in the state is 37033 sq. km., of which 1898 sq. km. is reserved forest, 33130 sq. km. is protected forest and 2005 sq. km. is unclassified forest, thus constituting 66.52% of the geographical area of the state and 4.84% of India's forest area.

The Forests of Himachal Pradesh known for their grandeur and majesty are like a green pearl in the Himalayan crown. This life supporting systems are presently under great stress due to impact of modern civilization, economic development and growth in human and cattle population.

According to national Forest Policy, 1988, at least two third i.e. 66% of the geographical area should be under forest in the hilly states like Himachal Pradesh. However, keeping in view that about 20 % of the area is inaccessible and beyond the tree limit, the State Government aims to bring 50% of the geographical area under forest cover.

The forests of the State have been classified on an ecological basis as laid down by Champion and Seth, and can be broadly classified into Coniferous Forests and broad-leaved Forests. Distribution of various species follows fairly regular altitudinal stratification. The vegetation varies from Dry Scrub Forests at lower altitudes to Alpine Pastures at higher altitudes. In between these two extremes, distinct vegetation zones of Mixed Deciduous Forests, Bamboo, Chil, Oaks, Deodar, Kail, Fir and Spruce, are found. The forests of Himachal Pradesh are rich in vascular flora, which forms the conspicuous vegetation cover. The richness and diversity of flora can be gauged from the fact that, out of total 45,000 species found in the country as many as 3,295 species (7.32%) are reported in the State. More than 95% of the species are endemic to Himachal Pradesh and characteristic of Western Himalayan flora, while about 5% (150 species) are exotic, introduced over the last 150 years.

Source: <http://fsi.nic.in/isfr-2015/isfr-2015-forest-and-tree-resources-in-states-and-union-territories.pdf>,
<http://hpforest.nic.in/pages/view/ZjY1NHhNmZhNTZz-the-forests,Forest survey report 2015>)

(b) Biodiversity

Himachal Pradesh is a hilly state and harbors one of the richest diversity of mountain landscapes having distinctive biodiversity.

The range of biodiversity elements represented in the state varies from sub-tropical region to that of temperate, dry temperate and alpine region. 95% of the floral and faunal species available in the state are endemic and 5% of the other species existing are of exotic nature. *Out of 77,450 species of animals state harbors 5721 species*, amounting to about 7.4% of Indian fauna. This shows richness of faunal resources of the State considering its small geographical area, which is only about 1.7% of the country.

Due to developmental activities many species of flora and fauna have been estimated to be threatened. The percentage of threatened species in the fragile mountainous region has been observed comparatively much higher in the state because of the dependence of the local people on biological resources for livelihood in the state. Survival of many valuable species of animals and birds, medicinal herbs, aquatic and domesticated floral and faunal species is at risk because of the continuous and unscientific extraction and hunting etc. from their natural habitats. The situation is fast deteriorating due to continuous and indiscriminate use of chemicals as fertilizers and spray of highly toxic insecticides / fungicides/ pesticides / weedicides etc. in agriculture and horticulture fields, which is spoiling the soil strata as well as microbial biodiversity of the soil in the state. Introduction of exotic species and forest fires are causing irreparable loss to biodiversity.

Source: <http://164.100.138.13/Biodiversity.aspx>)

(c) Wetlands

Chandertal is one of the high altitude wetland located in the cold desert part of Western Himalayas at a height of 4420 M above mean sea level. Chandertal catchment is an area of meadows, rugged rocks, snow and scree. Limnologically, Chandertal is an oligotrophic fresh water natural wetland located in the Tethys Himalayas which requires least intervention. However, anthropogenic stresses have started appearing in the form of tourism. It has been observed that tourism pressure is consistently increasing on the ecosystem. Migratory graziers come to the Chandertal from ages also add nutrients into the eco-system.

Khajjiar wetland is a part of the Ravi basin, located in the North-East of Dalhousie town, Chamba district of Himachal Pradesh. Khajjiar is situated at an altitude of 1950 M above mean sea level. It receives a high volume of surface runoff water during rainy season. It is presumed that wetland is fed by perennial natural sources of ground water in the centre, maintains its water level.

Renuka is oblong shaped wetland flanked by two parallel steep hills running east-west. Wetland possesses rich bio-diversity having more than 440 faunal species from protozoa to mammal. The wetland is covered with vegetation of sub-tropical forest comprises of Chhal, Sain, Bahera, Harar, Kachnar, Tun, Shisham and Amaltas, etc. Natural Sal forest exists in the northern side of the wetland. Although Renuka catchment is a small area of five hundred hectares, it harbours a large variety of wild life like Ghoral, Kakkar, Chital, Hare, Porcupine, Black Bear, Monkey and Languor etc. Wetland also possesses a good variety of aquatic life like fishes and tortoise. Wetland is gradually becoming the habitat for

many species of local and migratory birds. Major resident bird groups found in the area are pheasants, partridges, parrots, jungle fowl and magpie etc. Renuka wetland is a perennial water body fed by 21 seasonal streams which are vigorous particularly during the monsoon season. Internal springs of the lake are the perennial source of water. Underground network of channels in the Limestone and Dolomite formations of the area are possibly conduit to discharge groundwater to the wetland. In view of its rich biodiversity and uniqueness of the area, Ministry of Environment and Forests, GoI has designated the Renuka wetland as "Wetland of National Importance" in the year 1988. Since then, a number of conservation works have been successfully undertaken to restore the wetland to its pristine beauty.

Rewalsar is a natural wetland located in sub-tropical part of the Western Himalayas. Thousands of pilgrims and tourists from all over the world visit the place every year. Apart from its cultural importance, rural inhabitants utilize 145 local herbs, 51 shrubs, 42 trees and 24 climbers found in area for medicinal, vegetable, fodder and aromatic purpose. In view of its religious, cultural and ecological importance Rewalsar has been declared as a Wetland of National Importance by the Government of India. But this rare heritage is touching the critical stage of pollution and dying slowly due to massive anthropogenic pressure. There is an urgent need of intensive as well as extensive conservation measures to restore its ecology. Maharana Pratap Sagar also known as Pong Dam Reservoir or Pong Dam Lake was created in 1975 building the highest earth fill dam in India on the Beas River in the wetland zone of the Shivalik Hills of the Kangra district of the

state of Himachal Pradesh, in India. The Maharana Pratap Sagar has been declared "Ramsar site-wetland of International importance" by the Ramsar Bureau, Switzerland. It has emerged as a major habitat for migratory birds in the country as also an attraction for bird watchers. Known as an outstanding town of paradise for bird watchers, the wetland has rich bio-diversity with meagre forests round the Pong Dam Wetland having several tree species which serve as edible fruits for the migratory birds.

Source: <http://164.100.138.13/WetLands.aspx>

(d) Municipal Solid Waste management

Municipal Solid Waste (MSW) quantities are increasing and municipal authorities are not able to upgrade or scale up the facilities required for proper management of such wastes.

An assessment of the problem has suggested the following areas, which are needed to be taken care of while managing the huge solid wastes that are being regularly generated. They are - Identification of land for disposal of Solid Waste; Mobilization of financial resources for taking up one or more projects; Sharing of land between adjacent municipalities for an Integrated Regional Solid Waste Management; Use of appropriate technology for storage, transportation, disposal and processing of waste; Awareness generation among the citizens, community participation and capacity building and setting up of orientation for solid waste management in the Urban Local Bodies.

Report Of CPCB On "Status Of Compliance By CPCB With Municipal Solid Wastes (Management And Handling) Rules, 2000" for the year 2013-14 revealed that total 56 Urban

Local Bodies (ULB)s are responsible in the state for MSW management. There are one Municipal Corporation, 25 Municipal Councils, 23 Nagar Panchayat and 7 Cantonment Boards. Total 18 ULBs have applied for authorization and authorization granted to 08 ULBs. As per Schedule-I, by 2003, 09 ULBs established waste processing facilities and shared facility by 02 ULBs. Landfill sites identified by 50 ULBs and Landfill under construction in 02 ULBs (Nalagarh & Baddi). Out 56 ULBs, none has complied with the MSW Rules. Presently, 12 ULBs are processing MSW (through pit composting, vessel composting & Stack technology) in 10 facilities without landfill provision. Another 6 ULBs are planning & constructing waste processing facilities. Monitoring not carried out as no ground water sources at the sites.

Source:

http://www.cpcb.nic.in/divisionsofheadoffice/pcp/MSW_Report.pdf
<http://hppcb.nic.in/NGT.pdf>
<http://hppcb.nic.in/MSWS2015.pdf>

Biomedical Waste Management

The HP Pollution Control Board enforces the Bio Medical Waste (Management and Handling) Rules, 1996 / 2000. As per the provision of the rules it is mandatory for all HCEs to treat BMWs generated by them either on their own or through some authorized Common BMW Treatment Facility (CBWTF). There are three CBWTFs in the state. The combined incinerator capacity of these facilities is 440 Kg/Hr for treatment of the bio-medical wastes.

According to a CPCB report, in 2009, 1278 kg/day (2009) of biomedical waste generated was properly treated. There were approximately 538 health care facilities in the state with 9699 beds.

Source: http://cpcb.nic.in/Bio_medical.php,
<http://www.cpcb.nic.in/wast/bioimediawast/StatusBioMediawaste2009.pdf>

(e) Water issues

Every year, about 1,200,000 million m³ of water flows down from the Himalayan Rivers. Himachal Pradesh is one of the few states, which has come out with their state water policy, as early as in 2005 and was amended in 2012 for sustainable management of State's water resources.

The State Government has accorded top priority for setting up of a Common Effluent Treatment Plant (CETP) through a Special Purpose Vehicle (SPV) namely M/S Baddi Infrastructure Ltd, formed by Baddi Barotiwala Nalagarh Industrial Association located in District Solan. The CETP can serve 990 industries present in 9 industrial areas. This is a step towards reducing and abating environmental pollution in the area.

Tourism in HP is characterized by significant seasonal variations (with a clear peak during the summer months) and the agglomeration of visitors in a few locations (with over 55% of tourists concentrated in Shimla, Kullu, and Kangra) has led to high levels of congestion and tremendous pressure on the natural resources of the state. There is a huge stress in the urban drinking water sector due to tourist influx during the summer months.

For Himachal Pradesh, water resource systems are very complex, and an integrated water resource data system is required. The information system must incorporate data on water projects, water use, extractions, return flows, and locations of different types of catchment protection. The data system could be quite useful if it is a GIS based system and will require to be planned and managed on a well-funded and highly professional basis.

A lot needs to be done on integrated cross sector water resource planning. The existing projects are mainly implemented on a piecemeal basis. The need for better coordination between the water agencies has been frequently raised as a pertinent issue by government departments and non-government stakeholders. The need for an apex nodal agency to coordinate water resources planning has been widely seen as an important requirement.

There is a need to improve the institutional approach to water management, particularly by promoting inter-departmental coordination to ensure convergence of environmental objectives and minimize inter-sectoral conflicts.

Source: <http://www.teriin.org/projects/green/pdf/HP-Water.pdf>

(f) Ground water issues

Climate change has started ringing alarm bells in Himachal Pradesh as not only rain and snow pattern has been affected, but now groundwater level too has decreased significantly. The groundwater resources occur mainly in unconsolidated sediments of inter-mountain valleys and sub-mountain tract. Kangra, Una, Hamirpur, Bilaspur, Mandi, Solan and Sirmaur districts, particularly valley areas, depend on groundwater for their needs.

A report prepared by the Central Ground Water Board has stated that due to extensive groundwater usage for irrigation and the recently set up industrial units in Una valley, the levels are likely to further show depleting trend. There is an urgent need for the state government to initiate water level monitoring network both in shallow and deep aquifers to monitor its behaviour on short as well as long term basis, it added. Studies state that as on

March 2011, the stage of groundwater development in Una and Hum valleys of the district was 108% and 99%, respectively, and falls under critical category of development.

Another report on Solan district by Central Ground Water Board said that in many parts availability of water during summer is limited, particularly in hilly areas during drought/ low rain fall years. There is thus, immediate need to conserve and augment water resources. It said that presently, large development of ground water is observed in industrial belts of Nalagarh valley, wherein fall of water level down to six meters have been observed in parts.

Thus, depletion in ground water levels and also vulnerability to ground water pollution, are the major issues in this industrial belt.

Report said that in alluvial areas of Nalagarh valley, though there is scope for ground water development, as stage of ground water development is only 52%, however, there is need to adopt cautious approach and phased manner development of ground water in view of depleting water levels in some parts.

This decline can be attributed to fast pace of development in recent years, both in agriculture sector and industrial sector.

Source:

<http://timesofindia.indiatimes.com/city/shimla/Sharp-drop-in-groundwater-level-in-HP/articleshow/51285701.cms>

http://www.cgwb.gov.in/District_Profile/HP/Solan.pdf ,

http://www.cgwb.gov.in/District_Profile/HP/UNA.pdf ,

http://www.cgwb.gov.in/District_Profile/HP/Kangra.pdf

(h) 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. Central Pollution Control Board initiated National Ambient Air Quality Monitoring (NAAQM) programme in the year 1984 with only seven

monitoring stations in the country. Further, it has been strengthened by increasing the number of monitoring stations with 11 monitoring stations in HP.

City	Monitoring station (Nos.)
Damtal	2
Parwanoo	2
Poanta Sahib	2
Shimla	2
Kala Amb	2
Baddi-Barotiwala	1

CPCB has identified Damtal, Poanta Sahib, Parwanoo and Shimla as polluted cities in HP which as per the prescribed National Ambient Air Quality Standards (NAAQS).

Air quality standards fixed for 24 hour average is 100 $\mu\text{g}/\text{m}^3$ for RSPM and 80 $\mu\text{g}/\text{m}^3$ for SO₂ & NO₂ and annual average standard is 60 $\mu\text{g}/\text{m}^3$ for RSPM, 50 $\mu\text{g}/\text{m}^3$ for SO₂ & 40 $\mu\text{g}/\text{m}^3$ for NO₂.

As per the data collected for the year 2014-15, annual average values of SO₂ and NO_x at all the NAMP stations were observed well below the permissible limit for the annual average. The peak value of SO₂ was observed as high as 20.8 $\mu\text{g}/\text{m}^3$ at H.B Baddi NAMP station and peak value of NO_x was observed 108.8 $\mu\text{g}/\text{m}^3$ at Nalagarh NAMP Station.

The annual average values of RSPM at both the NAMP stations at Shimla, Sector IV Parwanoo, Manali and Dharamshala were observed well below the permissible limits for the annual average. While for other stations at Sector-I Parwanoo, DIC Baddi, AHC Barotiwala, MC Nalagarh, H.B. Baddi, Damtal-I, Damtal-II, Paonta Sahib, Gondpur, Kala Amb, Trilokpur, Una, Mehatpur, Both the stations at Sunder Nagar was observed above the permissible limit for the annual average.

At the NAMP stations at Sector I Parwanoo, Sector IV Parwanoo, DIC Baddi, AHC Barotiwala, MC Nalagarh, HB Baddi, Kala Amb, RO Una, DIC Mehatpur and Hadimba Road Manali in comparison to previous year's data, there is decrease in the level of RSPM has been observed, however at NAMP stations Shimla, Damtal, Paonta Sahib, Gondpur, Trilokpur, Sunder Nagar and Nehru Park Manali increase in the level of RSPM has been observed in comparison to previous year's data.

Source: http://cpcb.nic.in/Non_attainment.php,
<http://www.cpcb.nic.in/Network.php>,
<http://hppcb.nic.in/Publications/AR-2014-15.pdf>

(2) Laws and Polices

The Himachal Pradesh State Pollution Control Board (HPSPCB) is a statutory authority entrusted to implement environmental laws & rules within the jurisdiction of the State of Himachal Pradesh.

(3) Environment Sustainability Index (ESI) 2011

The index aggregates indicators that reflect:

- anthropogenic activities of production, consumption and distribution that exert pressures on the environment,
 - state of air quality, water quality, land use & agriculture, forests & biodiversity;
 - measures of the impact of the current state of the environment and resource extraction on ecosystem and human health; and
 - policy responses and society's efforts to preserve the environment.
- ESI is constructed as a composite index from 41 key environmental indicators selected using the Driving Force-Pressure-State-Impact-Response (DPSIR) framework. These indicators capture the driving forces

that extract from and pollute the environment (Driving Force); depletion and pollution (Pressure); present condition of the environment (State), impact on the ecosystem and human health (Impact) and policy and societal efforts to reduce impacts and protect the environment (Response)

- ESI is designed to compare Indian States with their peers and does not indicate an absolute level of achievement. Although there are no clear normative benchmarks or thresholds for 'good' performance on many of the indicators, the sources on each indicator can be ordered from 'better' to 'worse'. The overall ESI score provide a quick snapshot of State performance, the sub-indices are far more indicative and far more informative, highlighting areas for State intervention.
- Based on the aggregate ESI, states are categorized into five groups where in HP falls in the group with 80-100 percentile. This means State most likely to remain sustainable

VII. Performance Audit Report on the Rehabilitation of Abandoned Mines at the Department of Minerals and Energy by the Auditor General of South Africa-2008

OVERVIEW

Mining is an important economic activity for any nation but it has adverse effects too on the general environment as it causes:

1. Pollution of water and groundwater systems.
2. Pollution of agricultural soil, air pollution due to smelter emissions,

3. Sinkholes due to the accelerated weathering of dolomites by acid mine water, uncovered shafts, dust, and
4. The destruction of ecosystems.

Section 43 of the Minerals and Petroleum Resources Development Act, 2002 (MPRD Act) of South Africa, stipulates until a closure certificate has been issued, legally, the owner of a mine remains responsible for all liabilities related to that mine if a mine ceases to operate.

Section 46 of the MPRD Act of South Africa stipulates that if a closure certificate is not issued and no party can be traced to assume responsibility for the liabilities of an abandoned mine, it is classified as "derelict and ownerless" (abandoned). The Department of Minerals and Energy (DME) is responsible to provide funding for their rehabilitation, management monitoring of closed/abandoned mines.

Consequent on deficiencies identified during the financial audit of DME the Auditor-General of South Africa (AGSA) had taken up a performance audit of the rehabilitation of abandoned mines in the year 2008.

Objective of the Audit

The audit was initiated with following objectives:

1. To examine environmental impact of un-rehabilitated abandoned mines,
2. To examine measures taken to minimize social impact, rehabilitate un-rehabilitated abandoned mines timely and effectively and address the adverse impacts of abandoned mines
3. To facilitate public accountability, to identify lack of accountability on the part of actors and to bring the lapses to the attention of the executive authority and Parliament.

4. To see the governance arrangements to classify and systematically target those mines that posed the highest risk to the environment.

Audit Scope

The AGSA conducted a performance audit on the rehabilitation of abandoned mines to determine whether the processes followed by the DME ensured the timely and cost effective identification and rehabilitation of abandoned mines to minimize adverse social and environmental impacts.

Audit Methodology employed

The Performance audit was conducted in accordance with the Performance Audit Manual 2008, of Auditor General of South Africa, containing the policies, standards and guidelines for the planning, execution, reporting and follow-up of performance audits conducted in the public sector.

Audit Findings

1. Strategic planning

The DME did not have an approved national strategy for the rehabilitation of abandoned mines and so there were no set time frames, priorities for rehabilitation. The rehabilitation efforts by the DME were ineffective to address the environmental and social impacts associated with un-rehabilitated abandoned mines.

2. Information system to identify the status of mines

No policies or procedures had been implemented by DME under integrated system to ensure that they had access to information to identify mines that were abandoned to update the information system.

3. Organizational capacity and structure

The department had thin organizational structure and poor manning. This has effected implementation of rehabilitation of

abandoned mines and monitoring of activities by DME.

4. Evaluation and adjudication of bids

- The Auditor General observed inordinate delays in finalizations of Tenders and Re-tendering in 38% (12 out of 32) of the cases leading to delays in commencement of rehabilitation projects.
- This had resulted in increased costs on average 30.54% per contract.

5. Budgeting and allocation of funds to projects

- Lack of specific policies or procedures for the allocation of funds to the committed list of rehabilitation projects at abandoned mines, funds were allocated on an ad hoc basis to a project on availability of funds resulting in non-completion of projects due to paucity of funds during specific financial years.
- Due to lack of policy direction and pace in execution allotment of funds also decreased substantially. The meagre funding also affected post-rehabilitation monitoring activities and outstanding work to address secondary pollution, Creation of ongoing awareness and Management and maintenance

6. Insufficient involvement of all stakeholders.

No funds were allocated for post-rehabilitation monitoring activities. Some needs identified with regard to the previously rehabilitated mines include:

- Outstanding work to address secondary pollution
- Creation of ongoing awareness
- Management and maintenance
- Insufficient involvement of all stakeholders.

7. Communication and coordination

Several internal and external parties were identified as role players in the process of rehabilitating abandoned mines. The external role players include:

Institutional: The mining industry

The South African Government (national, provincial and local): institutions and the relevant institutional structures, for example, DWAF, DEAT Geoscience, CSIR, Department of Agriculture, Department of Labour, Department of Housing, Department of Health, and Water service authorities (if separate from local government).

Community related

The public, divided into sub-groups (landowners, communities, forums, unions, Associations, etc.) Opinion leaders and/or role models and community leaders (tribal authorities). Non-governmental organisations (NGOs) and community-based organisations (CBOs)

- An interdepartmental forum in the form of the governmental task team (GTT) for mine closure and water management was established to strengthen all communication channels between government departments regarding mining in South Africa. The GTT consisted of representatives from the DME, departments of Water Affairs, Forestry, Environmental Affairs and Tourism.
- But there was lack of communication between the external and internal role players as internal and external communication channels had not been defined, structured and established in a way to ensure proper communication during rehabilitation projects with all stakeholders.

8. Use of Council for Mineral Technology (Mintek) as project manager

The Council for Mineral Technology (Mintek), a statutory body approached the DME, expressing their interest to assist with the completion of the outstanding projects. The DME decided not to put the contract out on tender in view of Mintek's proposal despite expiry of contract with the consortium on 31 March 2008. Non appointment of new asbestos coordinator to manage the outstanding rehabilitation work at the abandoned asbestos mines has adversely affected the environment.

Recommendations by the Auditor-General

- a) Preparation of the national strategy for rehabilitation of abandoned mines to be approved and implemented and a business plan drafted with realistic, clearly defined objectives with specific time frames and responsibilities, prioritising high-risk rehabilitation projects.
- b) Increase in the rate of rehabilitation to reduce the adverse impact of abandoned mines on the environment.
- c) An integrated system for recording and reporting on the status of abandoned mines should be established to monitor the activities of active and inactive mines in good time the database and the potential liability are updated accordingly.
- d) An action plan should be put in place to ensure that a structure is established within the DME to sufficiently deal with the rehabilitation of abandoned mines.
- e) Measures should be instituted to ensure continuity of the involvement of staff assigned to the rehabilitation of abandoned mines.
- f) Measures to ensure the effective evaluation and adjudication of tenders and

the timely appointment of contractors are to be taken.

- g) Policies and procedures for the budgeting of rehabilitation projects should be established and measures to be taken to ensure that budget planning takes place in time to ensure the sufficient and timely allocation of funds to rehabilitation projects and post rehabilitation activities.
- h) The DME should formalise communication channels with internal and external stakeholders involved in the rehabilitation of abandoned mines in a way that would promote accountability and service delivery.
- i) The rehabilitation of abandoned mines and related issues should be added as a standing point the agenda of the GTT
- j) The DME should ensure that complete and accurate information is used for the planning of future rehabilitation project commitments.
- k) Measures should be instituted to ensure that the asbestos coordinator, as well as contractors used for rehabilitation projects, have the necessary skills and knowledge to ensure efficient and effective project management. Furthermore, knowledge transfer to the DME should be a requirement.

Response of DME

DME accepted most of the recommendations and proposed various actions regarding budgeting, management of database, reprioritization of works, organizational capacity, better communication and monitoring etc.

Learnings

The responsibilities towards rehabilitation of closed or abandoned mines are defined in the statute of South Africa. The Audit conducted

by AGSA is comprehensive and have well defined objectives and scope. The course of Audit was focused towards purpose and activities of DME, South Africa, lacunae and shortcomings in policy making, implementation mechanism and machinery of the department. Audit succeeded in identification of range of shortcomings from strategic planning to issues like lack of co-ordination in various stakeholders. Delays in putting system in place, reporting and steps to avoid delays and avoid fallout in the form of cost and time overruns had also been well reported by Audit. The department had accepted the audit observations and positively reacted to rectify the problems identified by Audit and settle the issues.

Mining is an important economic activity even in India and there are lot of concerns raised by environmental activists, civil society in addition to the supreme audit institutions. The rehabilitation of mines in India is ensured through Mine Closure plans prepared on the basis of guidelines issued by the government. However, as has been pointed out even by CAG in audit reports like Performance Audit of Coal India Limited Corporate Social Responsibility (9 of 2011). It was observed that the guidelines regarding Mine Closure Plan were not adhered to in case of all three sampled mines as per the guidelines. As per the study of The Energy and Resources Institute (TERI) India does not have a detailed inventory of abandoned mines; however, as per the estimates of Centre for Science and Environment (CSE), there are at least 240 abandoned coal mines where no reclamation has taken place. Under the Sustainable Development Framework the issue of mine closure is an important aspect and the public auditors may find interesting strategies and

requirements with respect to environmental protection and management in SDF. This kind of audits can be attempted even in India as the risks are existing and the Government is initiating policy initiatives like SDF.

Source:

[Report of the Auditor - General South Africa to Parliament of South Africa on a performance audit of the rehabilitation of abandoned mines at the Department of Minerals and Energy-October- 2009](#)

VIII. Performance Audit: Compliance with Environmental Laws in Lucknow by Government of Uttar Pradesh (Report No. 06 of 2011)

The Environment (Protection) Act, 1986 sets out that environment includes water, air and land and the inter-relationship which exists among and between water, air and land, human beings, other living creatures, plants, micro-organisms and property. Sustainable development involves the integration of social, environmental and economic objectives.

The Constitution of India mentions the responsibilities of the state and individual regarding protection and conservation of environment.

The population of Lucknow City had been projected as 2.50 million and 2.81 million in the years 2006 and 2011 respectively in the Detailed Project Report (February 2007) for Municipal Solid Waste (MSW), prepared by Regional Centre for Urban and Environment Studies (RCUES) for Lucknow Nagar Nigam (LNN). This rapid growth has impacted the environment and its various resources including land, water and bio-diversity. In this background Performance Audit on Compliance with Environmental Laws in Lucknow City was conducted. The focus of the Performance Audit conducted (May-August

2010) and information collected (January 2012) had essentially been on compliance with Environmental Laws and Building Bye-laws in Lucknow City, the capital of the State of Uttar Pradesh in regard to :

- a) Water and air Pollution;
- b) Waste Management including Municipal Solid Waste (MSW) and Bio Medical Waste (BMW);
- c) Plastics Manufacture and Usages;
- d) Management of Batteries; and
- e) Building Bye-laws.

Audit Objectives:

Environmental audit is a systematic process of obtaining and evaluating information about various environmental aspects. In view of growing importance assigned to environmental issues and sustainable development, both at the national and international level, environmental audit has assumed greater significance. The objectives of this performance audit were to evaluate mainly:

- a) the measures taken and adequacy thereof for compliance to Environment Acts and Rules made thereunder for checking Water and Air Pollution, Solid Waste Management including MSW and BMW, Plastics Manufacture and Usage and Management of Batteries;
- b) Timely release of funds and their economical, efficient and effective utilization;
- c) Effectiveness of implementation of the provisions of Master Plan, Building Bye-laws, Zoning regulations and National Building Code, 2005; and
- d) Providing independent, credible and objective evaluation of the information provided by various Government agencies with regards to environment.

Audit Criteria:

The following audit criteria were adopted for performance audit to assess the compliance with environmental laws:

1. The Water (Prevention and Control of Pollution) Act, 1974 and Water Cess Act, 1977;
2. The Air (Prevention and Control of Pollution) Act, 1981, National Ambient Air Standards fixed time to time;
3. The Environment (Protection) Act, 1986; and various rules applicable in the period for waste management and regulation of plastics and batteries
4. Master Plan 2021 of Lucknow and National Building Code.

Scope of Audit and Methodology:

Performance audit on compliance with various environment Acts in Lucknow City for the period 2005-10 was conducted between May and August 2010. Records were examined at the Offices of the Directorate of Environment (DOE), UPPCB, Lucknow Nagar Nigam (LNN), Lucknow Jal Sansthan (LJS), Regional Transport Officer (RTO), LDA, Chief Medical Officer (CMO), UP State Housing Board (UPSHB), UP Jal Nigam (JN), UP Rajkiya Nirman Nigam (UPRNN), Sr. Superintendent of Police (SSP) Traffic, UP State Bridge Corporation (UPSBC), Divisional Forest Officer (DFO), District Industries Centre (DIC) and Director of Local Bodies.

The Audit methodology involved collection of data through document analysis, response to audit enquiries, questionnaires, joint physical verifications, photographic evidencing and examination of reports and records of various implementing agencies.

Major audit findings of the performance audit are discussed below:

UPPCB did not perform its role effectively as it failed to plan a comprehensive programme for prevention, control and abatement of air pollution in Lucknow City since its inception in 1975. Lucknow Nagar Nigam also failed to fulfill their mandate in relation to prevention, control and abatement of water pollution.

Low priority was accorded to environmental issues by the State Government as expenditure on the same was reduced from ₹ 1.48 million (0.025 per cent) to ₹ 0.31 million (0.002 per cent) of total expenditure of the State during 2005-11. Similarly, UPPCB also spent very little amount on pollution abatement measures, which ranged between 0.54 percent and 1.26 percent of the total expenditure of UPPCB during 2005-11.

Due to inadequate laboratory infrastructure, inadequacy of data, the State Government and its agencies were unable to effectively plan and implement their strategy and programmes.

Lack of modern equipment and non-upgradation of emission checking equipment with UPPCB, Regional Transport Officer (RTO) and Traffic Police resulted in ineffective monitoring of air pollution.

Suspended Particulate Matter (SPM) and Respiratory Suspended Particulate Matter (RSPM) were higher than the permissible limit of the National Ambient Air Quality Standard (NAAQS).

Despite its mandate, LNN did not adhere to the implementation schedule for the management of Municipal Solid Waste (MSW), including segregation of waste at source into biodegradable, recyclable and inert waste, even after the lapse of more than ten years of implementation schedule of MSW Rules.

Lack of co-ordination of UPPCB with various Government agencies to identify the existing Health Care Units in Lucknow City resulted in unreliable assessment of Bio Medical Waste (BMW) generated

Three major hospitals including State owned Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI) did not have adequate incineration facilities for BMW.

UPPCB failed to discharge its duty to identify all the sellers and users of plastic carry bags to verify their compliance with the environmental standards under the Plastics Manufacture, Sale and Usage Rules, 1999 (PM Rules). Also, it did not identify all the manufacturers, dealers, sellers, recyclers and bulk consumers of batteries in Lucknow City resulting in non-compliance to the Batteries (Management and Handling) Rules, 2001 (BM Rules) even after nine years of its framing.

Recommendations:

1. Water pollution:

- a) The bacteriological and chemical testing of drinking water, supplied by the LJS through its system, should be done on a regular basis at a prescribed periodicity;
- b) Database of all water bodies should be maintained and a detailed Action Plan prepared to improve water quality; and
- c) LNN should provide requisite infrastructure for disposal of sewage.

2. Air pollution:

- a) Assessment, recruitment and deployment of manpower for policing traffic on actual requirement needs to be undertaken urgently; and
- b) UPPCB should establish more and upgraded air quality monitoring stations in new areas of the City.

3. Municipal Solid Waste:

- a) Compliance criteria of implementation schedule should be adhered to;
- b) Effective steps should be taken to fill-up the shortages of manpower and transportation vehicles;
- c) Different color bins may be kept at source for segregation of waste into biodegradable, recyclable and inert waste; and
- d) *Safai Karamcharis* involved in collection of MSW should be provided with Personal Protection Equipment.

4. Bio-medical Waste:

- a) Demarcation of all the Health Care Units may be ensured and assessment of BMW generated may be made and attachment of all HCUs with incineration facilities may be ensured;
- b) UPPCB may ensure mandatory submission of a copy of log book detailing BMW collected, segregated and incinerated from occupier/operator; and
- c) All safety measures need to be taken for the staff handling BMW and working on the incinerator.

5. Plastic Waste:

- a) Proper and effective mechanism should be put in place for identification of manufacturers, sellers and users establishments of plastics by UPPCB and LNN; and
- b) Proper segregation and disposal facilities should be set up in the City.

6. Management of batteries:

- a) UPPCB may ensure compulsory registration of each manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer and bulk consumer; and
- b) Online registration facilities may be provided

7. Building code:

- a) Land should be earmarked for construction of garbage disposal and STP for the colonies developed by LDA and private builders; and
- b) Construction should not be allowed without the prior stipulated environment clearance.

Significance of Audit:

Growing of urbanization is seen as a sign of development and one third population of India is already leaving in cities. The urbanization however comes with lot of stress on environment of cities as the rate of urbanization is outpacing the rate of urban development. As a result, environmental performance of most of the cities as not up-to the mark. The stakeholders would be eager to know overall status of environment in their cities. The auditor is also able to express his opinion in respect of overall status of environment of a given city. This kind of audit can bring out an opinion on the outcome of working of local authorities which are given a specific responsibility under the constitution with respect to 'Urban forestry, protection of the environment and promotion of ecological aspects'. This particular audit brings out the advantages of an approach of environmental audit specific to large cities. This approach would help IAAD in audits of smart cities from environmental perspectives in future.

IX. Smart Cities: The Future Ahead

With half the world's population living in cities, increasing the strain on energy, transportation, water, building and public spaces, there is an increasing need for "smart" city solutions which are both efficient and sustainable on one hand and can generate economic prosperity and social

wellbeing on the other. Various definitions have been put forth for smart cities. Some of them have been highlighted below.

"Smart Cities have been characterized and defined by a number of factors including sustainability, economic development and a high quality of life. These factors can be achieved through infrastructure (physical capital), human capital, social capital and/or Information and Communication Technologies (ICT) infrastructure" – European Commission

The concept of smart cities originated at the time when the entire world was facing one of the worst economic crises. In 2008, IBM began work on a 'smarter cities' concept as part of its Smarter Planet initiative. By the beginning of 2009, the concept had captivated the imagination of various nations across the globe. Countries like South Korea, UAE and China began to invest heavily into their research and formation. Today, a number of excellent precedents exist that India can emulate, such as those in Vienna, Aarhus, Amsterdam, Cairo, Lyon, Malta, the Songdo International Business District near Seoul, Verona etc.

Interestingly, urbanization in India has for the longest time been viewed as a by-product of failed regional planning. Though it is inevitable, and will only change when the benefits of urbanization overtake the costs involved, it is an opportunity for achieving faster growth.

With increasing urbanization and the load on rural land, the government has now realized the need for cities that can cope with the challenges of urban living and also be magnets for investment.

Government of India's announcement of '100 smart cities' falls in line with this vision. India

to have 100 Smart Cities across 21 States in next five years. A total of ₹ 980 billion has been approved by the Cabinet for development of 100 smart cities and rejuvenation of 500 others. For Smart Cities Mission, ₹. 480 billion and for Atal Mission for Rejuvenation and Urban Transformation (AMRUT), a total funding of ₹ 500 billion has been approved by the Cabinet. Future roadmap for Smart Cities in India:

- **Smart heritage cities:** The government has introduced a project to develop 12 heritage cities across the country. Called HRIDAY Scheme or National Heritage Development and Augmentation Yojana, the cities included are Ajmer, Amaravati, Amritsar, Badami, Dwaraka, Gaya, Kanchipuram, Mathura, Puri, Varanasi, Velankanni and Warangal.
- **Smart ports:** The government plans to connect 12 smart cities with the maritime hubs at an estimated cost of ₹ 5000 billion (US\$ 7821.05 million).
- **Smart armed force stations (SAFS):** There is a proposal to develop 6 smart armed force stations (SAFS). Of the 6 stations; 3 will be Army stations, 2 of Airforce and 1 of the Navy.
- **Smart Aerotropolis:** The West Bengal government plans to develop first airport city called the Bengal Aerotropolis Pvt Ltd (BAPL) at Andal in Burdwan district.
- **Smart railways:** Ministry of Railways has introduced world-class station programme to upgrade and revamp the existing railway stations. New Delhi Station will be the first station to be redeveloped within this programme spread over 86 hectares land with 18 platforms to handle in excess of 500,000 passengers per day. The Surat railway station is also to follow with 2.27

lakh square meter for redevelopment of new station. Along with this a total of 1,052 stations have been identified for upgradation of passenger amenities. It is proposed to include 200 more stations under this scheme.

- **Smart villages:** Saansad Adarsh Gram Yojana (Parliamentarian's Model Village Scheme aims to ensure holistic development of identified gram panchayats. Under this programme, Andhra Pradesh is the first state to launch the 'Smart Village' plan aimed at making AP, a top state in the country by 2029.
- **DMIC:** The Delhi Mumbai Industrial Corridor (DMIC) running through six states Delhi, Western Uttar Pradesh, Southern Haryana, Eastern Rajasthan, Eastern Gujarat, and Western Maharashtra to build a dedicated freight corridors along the Delhi-Mumbai. The cities that have been identified are Dholera in Gujarat, Shendra-Bidkin in Maharashtra, Greater Noida in UP, Ujjain (MP) and Gurgaon in Haryana.
- **SEZ:** Guizhou International Investment Corp (GIIC) has signed a MoU with Kakinada SEZ (KSEZ), a subsidiary of GMR Infrastructure to develop industrial park over 2,000-acre land for setting up Chinese high-end equipment manufacturing plants. GIIC will invest \$500 million in developing the infrastructure and various facilities of the industrial park. These Chinese companies will invest \$2-3 billion in setting up their operations over the next 5 years and generating more than 5,000 jobs for both skilled and unskilled workers

What exactly can be a Smart System?

Taking example of Smart Water System, it will handle the water systems of Smart City with help of IT systems. The IT systems will

integrate and analyses a wide variety of data sources and provide both an intuitive way of visualizing and understanding patterns and anomalies, and an easy way of acting on them. The result is a view of water or wastewater operations that transcends individual systems, devices and departments. This end-to-end view gives you the key information you need to make better decisions that help lower costs and risk while increasing or recapturing revenue and enhancing customer satisfaction.

The Smart Water System will help water and wastewater operators:

- Leverage operational data holistically to create insights and improve water management.
- Anticipate potential delivery disruption and better forecast long-term water demand.
- Coordinate resources to protect water supply and drive conservation and sustainability.

What can be the role of Supreme Audit Institution of India, in preparedness for the coming future of Smart Cities??

We can have something like the Smarter City assessment tool as suggested by IBM:

By means of weightings we indicate the relative importance of the various Smarter City systems and factors. Based on specific city priorities, weightings can be modified, which will have a direct impact on the results.

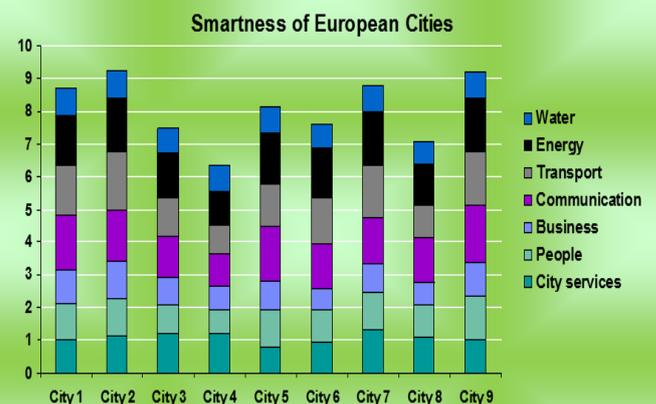
Smarter city Systems	Weights
People	7%
Business	7%
Communication	7%
Transport	20%
Energy	20%
Water	20%
City Services	20%
	100%

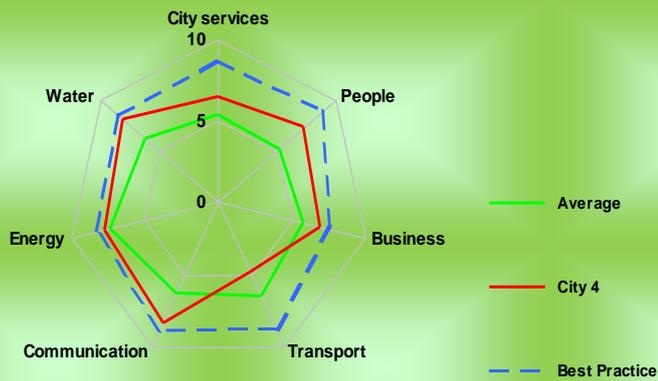
e. g. Break-up of assessment of Transport System could be as follows

Transport System Pre-requisites			
Investment in transport infrastructure	15%	3%	
Presence and quality of transport infrastructure	10%	2%	
Public Transport	10%	2%	
System Management			
Strategic Planning and Performance Management	5%	1%	
Smarter System			
Congestion Management	15%	3%	
System Outcomes			
Energy Efficiency of Transport System	15%	3%	
Accessibility	15%	3%	
Congestion	15%	3%	
	100%	20%	

Following data after being assessed for individual cities, can be compared among various cities for rankings and improvements.

The Smarter City Assessment Tool has been developed by IBM on the basis of proven location assessment methodologies for assessing business locations. The Tool ‘measures’ cities’ performance against many indicators for each of the Smarter City systems. It allows benchmarking of a city’s overall capabilities against peer locations, and best practice. The Tool identifies challenges that cities face and where improvements can be made. Example:





As Smart City will be highly dependent on IT systems. Our IT audit has to back force for assessing working of Smart Cities as well Analysis of Big data gathered by all IT systems holds the key to it. Data Analytics of such huge data will require Analytical tools as developed by firms like Google.

Though, such Smart systems in India are far-fetched reality as of now, but we can work in that direction towards strengthening our man-power towards growing 'Smart' systems.

Source:

[IBM red books. IBM Smarter Planet solutions.](#) ,
[Deloitte Smart Cities. Quora: Smart Cities.](#) ,
[The Hindu newspaper.](#)