

# Green Files NEWSLETTER

## INSIDE

 PG 4

**Training and Workshop  
conducted by iCED**

 PG 8

**Snapshot of Environmental  
News**

 PG 22

**Environment Degradation  
due to Oil Spillage**

 PG 26

**Plastic Waste  
Management -A review  
of current scenario  
worldwide**



*Green Files, our quarterly newsletter reflects recent environment news, events at iCED, publications and specific success story of relevant environment projects. It also highlights emerging trends, innovation, initiatives and efforts of different organizations to protect and rejuvenate the environment.*

# Editorial

Green Files, a quarterly newsletter published by iCED features glimpses of recent environment news, events, publications, persons and environment projects in focus. Emerging trends, innovation, initiatives and efforts of different organizations to protect the environment also find reflection in this newsletter.

Amid Covid-19 and related government guidelines, our training programmes were organized online, during the quarter April-June 2020. Two National Training programmes using MS Teams platform were conducted online on the subject “Audit of Health Sector with reference to SDGs” and “Environmental Management in PSEs (Steel and Power Plants)” during the same period.

To mark the 11<sup>th</sup> Foundation Day of iCED, a workshop was organised on the theme Climate Change- An Overview.

Apart from world environment news and brief about Petersberg Climate Dialogue-XI, this newsletter features article on preservation of Tiger: An initiative by Van Gujjar Community and Environment Degradation due to Oil Spillage. The newsletter also features an article on Plastic Waste Management.

We at iCED, look forward to your suggestions to make Green Files more relevant and appealing to the readers. Contributions in any form within the broad scope of the newsletter will be highly appreciated. These may be mailed to [iced@cag.gov.in](mailto:iced@cag.gov.in)

With regards,

**Manish Kumar**  
**Director General**

# CONTENTS

-  Training and Workshop at iCED ..... 4
-  INTOSAI NEWS ..... 5
-  State/Union Territory in Focus ..... 6
-  Environmental News ..... 8
-  The Petersberg Climate Dialogue - XI .....13
-  Performance Audit of Management of Solid Waste in Goa .....14
-  Sukhna Lake: A living entity with rights .....16
-  Tiger Watch –Preservation of Tigers (An Initiative by Vann Gujjar  
community) .....18
-  Audit Report on Protection of Valuable Forest- Swedish Audit Office .....20
-  Environmental Degradation Due to Oil Spillage .....22
-  Plastic Waste Management -A review of current scenario worldwide .....26

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## Training and Workshop at iCED

In view of travel and other restrictions due to COVID-19 during the period April – June 2020, iCED organized two online National Training Programmes (NTPs) on:

-  **Audit of Health Sector with reference to SDGs (11 – 15 May, 2020)**
-  **Environmental Management in PSEs (Steel and Power Plants) (22 – 26 June, 2020)**

NTPs were organized on the basis of Training Needs Analysis and other inputs. Audits on these issues are to be conducted by various offices within IA&AD

To mark the **11<sup>th</sup> Foundation Day of iCED** on **1 June 2020**, plantation activity was done within the iCED campus.



*Shri Manish Kumar, Director General, iCED planting tree on 11<sup>th</sup> Foundation Day of iCED*

An online workshop on the theme “**Climate Change: - An Overview**” was also organized during the day for officers and staff.

Dr. Chubamela Jamir, Assistant Director, The Energy and Resources Institute (TERI), New Delhi made an online presentation on implications of climate change and its linkages with the Sustainable Development Goals.



*Speaker interacting with the participants during the online workshop on Climate Change-An Overview*

 **Ajit Singh Choudhary**  
AAO, iCED

### 17th Steering Committee meeting

The Steering Committee meeting of INTOSAI Working Group on Environmental Auditing (WGEA) was conducted from 23 to 26 March 2020 through video-conference. WGEA Secretariat provided overview of the key areas of actions taken w.r.t **Work Plan 2020-2022**. It includes utilizing the full potential of INTOSAI WGEA products, contributing to follow-up and review of the UN SDGs and providing support for auditing the implementation of environmental SDGs as well as increasing competence of environmental stakeholders and communications. The areas of actions are to be implemented through 7 **Work Packages**, cited below:

- **Work Package 1: Assessment of the WGEA Products and Planning for the future,**
- **Work Package 2: SDG 12 - Responsible Consumption & Production – Focus on Plastic Waste**
- **Work Package 3: SDG 13 – Climate Action – Focus on Climate Finance**
- **Work Package 4: SDG 11 – Sustainable Cities and Communities – Focus on Transport**
- **Work Package 5: Increasing Understanding on Environmental SDGs**
- **Work Package 6: Experience Sharing and Capacity Building**
- **Work Package 7: Effective Communication and Stakeholder Relations**

SAI India is leading the *Work Package 2*, Co-lead in *Work Package 5 & 6* and Project Member in *Work Package 4*.

20<sup>th</sup> Assembly Meeting of INTOSAI WGEA is to be held in January 2021 in Rovaniemi, Finland.

### INTOSAI PFAC Initiative on the COVID-19 Pandemic

The **Policy, Finance and Administration Committee (PFAC)** advises the INTOSAI Governing Board and assists in meeting INTOSAI Strategic Goal 4 i.e to organize and govern INTOSAI in ways that promote economical, efficient, and effective working practices. SAI India is also one of the members of the committee.

In times of a health crisis like the COVID-19 pandemic, the presence of control and care and good use of public resources become urgent.

The PFAC has launched an **INTOSAI PFAC COVID-19 initiative website** <sup>1</sup> to assist INTOSAI and SAIs with continuity of operations during the pandemic. SAIs will also find information on relevant audit findings and methodologies related to pandemic prevention, preparedness and response.

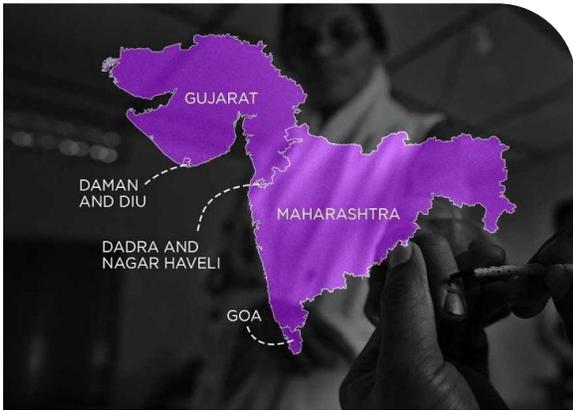
 **Manoj Kumar**  
AAO, iCED

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<sup>1</sup> <https://intosaicovid19.org/>

## STATE/UNION TERRITORY IN FOCUS

### Dadra and Nagar Haveli Daman and Diu



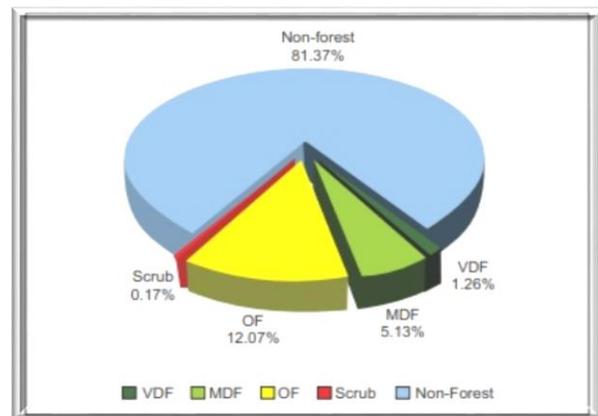
Union Territory created through the merger of the erstwhile union territories of Dadra and Nagar Haveli and Daman and Diu on **26 January 2020**. The territory is made up of four separate geographical entities Dadra, Nagar Haveli, Daman and the island of Diu. Combined Geographical area of UT is 603 sq .km.

#### Population (2011 Census)

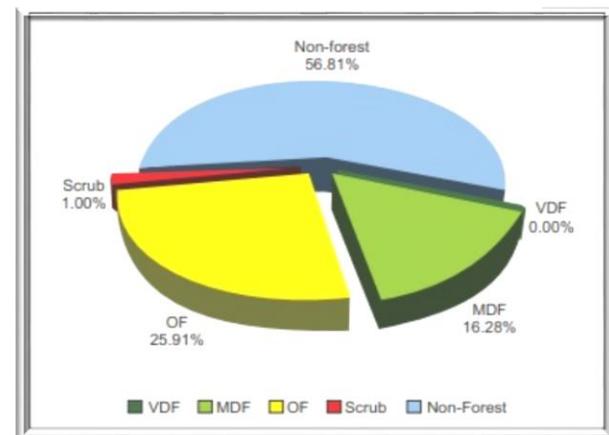
Population	Male	Female	Total
<b>Dadra and Nagar Haveli</b>	<b>193760</b>	<b>149949</b>	<b>343709</b>
<b>Daman and Diu</b>	<b>150100</b>	<b>92811</b>	<b>242911</b>

### Forest and Wildlife

Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Oct 2017, forest cover<sup>2</sup> in the UT is 227.65 sq km which is 37% of the their combined geographical area. In terms of forest canopy density classes, UT has 1.40 sq km under **Very Dense Forest (VDF)**, 85.62 sq km under **Moderately Dense Forest (MDF)** and 140.63 sq km under **Open Forest (OF)**.



Dadra and Nagar Haveli



Daman and Diu

<sup>2</sup><https://fsi.nic.in/isfr19/vol2/isfr-2019-vol-ii-dadra-nagar-haveli.pdf> <https://fsi.nic.in/isfr19/vol2/isfr-2019-vol-ii-daman-diu.pdf>

The territory has moderate thick jungle cover.

**Teak, Sandra, Khair, Mahara and Sisam** are the major tree species in the region-

Wild animals such as **Panther, Nilgai, Sambar** are found especially in the Natural Forest area. Varieties of birds are found in different parts of the territory.

### Environmental Concerns<sup>3</sup>

The territory has significant portion of land being **hilly / undulating terrain** mostly under agricultural use and forest. The threat to the environment of the region is due to urbanization, deforestation, land degradation, dependence on ground water, inefficient waste water systems and growing industrialization. **Rapid industrialization** owing to its accessibility to industrial hubs like Vapi, Surat, Mumbai etc resulted in **unplanned urban development**. There has been steady **growth in population** chiefly due to **migration**. Unorganized industrial development has led to scattered growth of industries causing difficulties to provide necessary infrastructure within the vast region and pressure on environment.

### Water Environment:

Pollution of water resources by **industrial discharge, household waste and sewage** is the most severe environmental problem. Rapid expansion of industries without proper sewage systems, drainage systems, sewage treatment facilities, effluent treatment plant has become the major cause of deterioration in water quality. Deteriorating water quality in turn affects the **soil quality** and has serious impact on **crop yield** as well as **human health**. Further, industries are not covered by water supply schemes and meet their requirement through use of **bore wells**.

### Ambient Air Quality

Air quality varies across the regions due to **dispersal of industries** leading to effective **dispersion of gases** emitted from these industries. Due to supply side constraints in meeting the increasing demand for electricity, most of the industries have their own **D.G. Sets** raising the pollution levels. **Heavy vehicular traffic** also causes pollution.

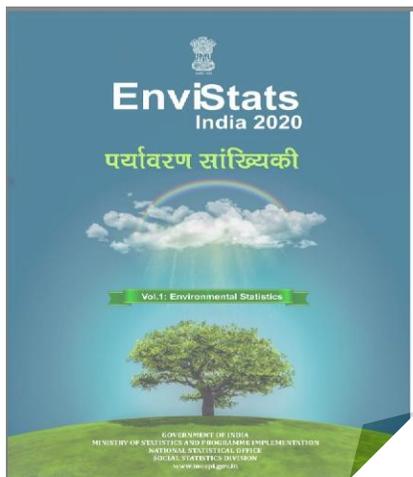
 **Virendra Jakhar**  
Sr AO, iCED

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<sup>3</sup>[http://pdadnh.nic.in/Reports/06%20Chap%202\\_Physical%20Profile%20of%20DNH.pdf](http://pdadnh.nic.in/Reports/06%20Chap%202_Physical%20Profile%20of%20DNH.pdf)

## ENVIRONMENTAL NEWS

### EnviStats-India 2020: Vol. I: Environment Statistics



Please click image to access full document

National Statistical Office (NSO), Ministry of Statistics & Programme Implementation (MoSPI), Government of India released **EnviStats-India 2020: Vol. I: Environment Statistics**<sup>4</sup> prepared as per the **Framework for the Development of Environment Statistics (FDES 2013)** released by Statistics Division, United Nations Department of Economic and Social Affairs (UNDESA)<sup>5</sup>.

Six Chapters of Environment Statistics focus on **six fundamental components of FDES 2013** viz. Environmental Conditions and Quality; Environmental Resources and their

Use; Emissions, Residuals and Waste; Extreme Events & Disasters; Human Settlements and Environmental Health; and Environmental Protection, Management & Engagement.

This publication is the **third** in the series. The first issue, released in March 2018, provided information on 84 of the 100 indicators in the Core Set and 44 and 6 of the Tier 2 and Tier 3 indicators respectively. These were subsequently updated in the subsequent issue of EnviStats India released in March 2019.

**EnviStats-India 2020: Vol. I** has an improved coverage of the indicators prescribed by FDES, with information provided on 217 indicators, of which 88 belong to the Core Set or Tier I, 106 to the Tier II and 23 to the Tier III<sup>6</sup>.

### National Report on Assessment of Climate Change over the Indian Region

India's **first ever National Report**<sup>7</sup> on the state of the climate crisis prepared under the aegis of Ministry of Earth Sciences (MoES) with title "**Assessment of Climate Change over the**

<sup>4</sup> [http://www.mospi.gov.in/sites/default/files/reports\\_and\\_publications/statistical\\_publication/EnviStats/Completer\\_ES2020\\_Vol1.pdf](http://www.mospi.gov.in/sites/default/files/reports_and_publications/statistical_publication/EnviStats/Completer_ES2020_Vol1.pdf)

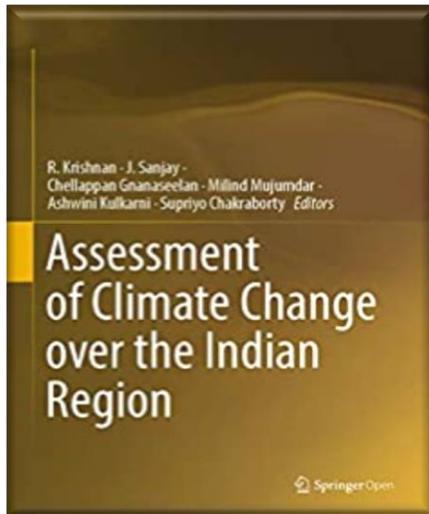
<sup>5</sup> <https://unstats.un.org/unsd/environment/FDES/FDES-2015-supporting-tools/FDES.pdf>

<sup>6</sup> Statistical Commission in its 51st session approved multiple changes to the global indicator framework (April 2020). The updated

tier classification contains **115 Tier I indicators, 95 Tier II indicators and 2 indicators that have multiple tiers**. There are 19 indicators with tiering pending a data availability review<sup>6</sup>.

<sup>7</sup> <https://link.springer.com/content/pdf/10.1007%2F978-981-15-4327-2.pdf>

**Indian Region”** has been released in June 2020.



[Please click image to access full document](#)

The report analyses where India stands regarding long-term changes in climate patterns, and their attendant risks. Key findings of the report are as follows:

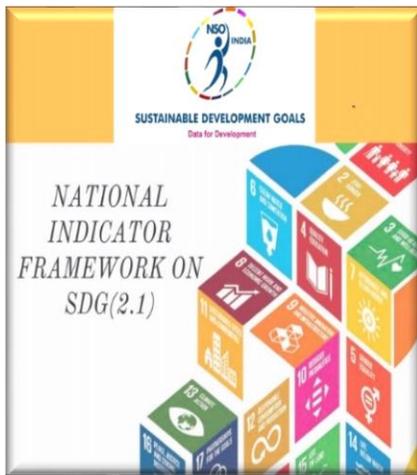
- India's **average temperature** has risen by 0.7 degrees Celsius during 1901-2018. The emission of greenhouse gases (GHG) is key reason of the temperature rise.
- It also predicted **two different scenarios related to India's temperature rise** by 2099. In a best-case scenario, temperature will still rise by 2.7 degrees Celsius while in the worst-case scenario temperature will increase by 4.4 degrees Celsius by the end of the century.
- The **precipitation** over India has reduced by 6% between 1951-2015 because of the polluting aerosol “brown

cloud”, with notable decreases over the Indo-Gangetic Plains and the Western Ghats. Monsoon is expected to become more extreme.

- April-June **heatwaves** are to become 3-4 times more frequent by 2099 as compared to that of 1976-2005.
- Sea-level rise** in the North Indian Ocean (NIO) has occurred at a rate of 1.06–1.75 mm per year during 1874–2004 and has accelerated to 3.3 mm per year in the last two and a half decades (1993–2017).
- Surface temperatures in the Indian Ocean** including Bay of Bengal and the Arabian Sea have increased by 1 degree Celsius during 1951-2015, higher than the global average.
- The frequency of **warm days and nights** is expected to increase up to 55% and 70% respectively by the end of twenty first century.

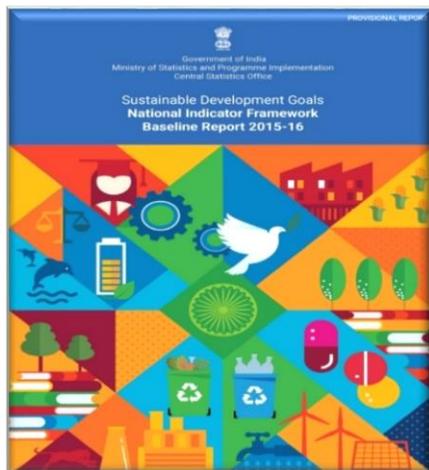
### **Sustainable Development Goals – National Indicator Framework and Progress Report 2020**

Ministry of Statistics and Programme Implementation (MoSPI) released the **National Indicator Framework (NIF)** on SDGs with around **300 national indicators**.



[Please click the image to access full document](#)

NIF is the backbone of monitoring of SDGs at national level. Based on NIF, a baseline report on SDGs- **NIF baseline report 2015-16**, was released for monitoring at National level.



[Please click the image to access full document](#)

MoSPI also released first edition of India's progress report on the Sustainable Development Goals (SDGs), namely, "**Sustainable Development Goals-National Indicator Framework Progress Report, 2020**". It is the first progress report, with reference to the baseline report, with time series data.

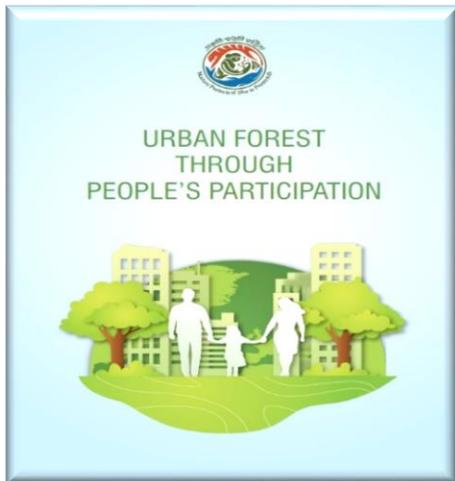
MoSPI in consultation with other stakeholders is in the process of examining the **remaining 36 SDG targets** (out of 169) against which, the national indicators are under development in the NIF.



[Please click the image to access full document](#)

## **Urban Forest scheme to develop 200 'Nagar Van' across the country in next five years**

On the occasion of **World Environment Day**, Government of India announced implementation of the **Nagar van scheme** to develop **200 Urban Forests** across the country in **next five years** with a renewed focus on people's participation and collaboration between Forest Department, Municipal bodies, NGOs, Corporates and local citizens. These forests will work as lungs of the cities and will primarily be on the forest land in the City or any other vacant land offered by local urban local bodies.



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Urban Forestry has innumerable benefits ranging from economic to ecological. Its ecological benefits include **reduction in temperature rise** in urban areas, reduction in **CO<sub>2</sub> emissions** through photosynthesis, **removal of other air pollutants**, prevention of **soil erosion**, **recharge of groundwater**, and **stabilization of soil**. They act as **home to many animals and birds** and hence help in **conservation of biodiversity**.

India has vowed to create an additional carbon sink (a natural or artificially created environment that absorbs CO<sub>2</sub> from the atmosphere) of **2.5 to 3.0 billion tonnes of CO equivalent through additional forest and tree cover by 2030** and urban forestry will have an important contribution towards achieving it.

## iFLOWS- Mumbai, a state-of-art Integrated Flood Warning System



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**iFLOWS- Mumbai, a state-of the-art Integrated Flood Warning System** for Mumbai has been launched<sup>8</sup>. The system will help make the city become more resilient, by providing early warning for flooding especially during high rainfall events and cyclones. It will be possible to have an **estimate of the flood inundation three days in advance, along with three hours - six hours Nowcast** (immediate weather updates). It will be very useful, especially if people need to be evacuated from low-lying areas as we will be able to forecast 12 hours in advance that a particular spot may get flooded. The system will also **forecast the rainfall in each pocket**.

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<sup>8</sup> <https://pib.gov.in/PressReleasePage.aspx?PRID=1631096>

The sophisticated system has been developed by the Ministry of Earth Sciences using its in-house expertise, in close collaboration with the Municipal Corporation of Greater Mumbai (BMC).

## **Swachh Bharat Mission (Grameen) Phase-II**

Union Cabinet, has approved the Phase II of the Swachh Bharat Mission (Grameen)<sup>9</sup> [SBM (G)] till 2024-25, which will focus on Open Defecation Free Plus (ODF Plus), which includes **ODF sustainability and Solid and Liquid Waste Management (SLWM)**.

It will also be implemented from **2020-21 to 2024-25** in a mission mode with a total outlay of **Rs. 1,40,881 crores**. Incentive of Rs.12, 000 for construction of Individual Household Toilet (IHHL) to the newly emerging eligible households as per the existing norms will continue. The **fund sharing pattern** between Centre and States will be 90:10 for North-Eastern States and Himalayan States and UT of J&K; 60:40 for other States; and 100:0 for other Union Territories, for all the components. The rural sanitation coverage in the country at the time of launch of SBM (G) on 02.10.2014 was reported as 38.7%.

## **Amendments in Mineral Laws**

Ministry of Coal has taken initiatives<sup>10</sup> to re-visit old laws with an aim to improve efficiency, ease of doing business and to open up coal sector for improving domestic coal production and reduce imports. Salient features of **Mineral Laws (Amendment) Act, 2020** are given below:

-  Allocation of coal blocks for composite Prospecting License-cum-Mining Lease (“PL-cum-ML”).
-  Any selected company to carry on coal mining operation without possessing any prior coal mining experience in India.
-  100% FDI through automatic route.
-  No requirement of previous approval in cases where allocation or reservation of coal/ lignite is made by Central Government
-  Entitlement to utilize mined coal in any of its plants/ its subsidiary/holding company.
-  Amendment of Mineral Concession Rule 1960 corresponding CMSP and CBA Rules and related guidelines

 **Vijendra Singh Tanwar**  
AAO, ICED

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<sup>9</sup> <https://pib.gov.in/PressReleasePage.aspx?PRID=1603628>

<sup>10</sup> <https://pib.gov.in/PressReleasePage.aspx?PRID=1629073>



## THE PETERSBERG CLIMATE DIALOGUE - XI

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The eleventh session of Petersberg Climate Dialogue took place amid the covid – 19, from 27-28 April 2020, in a virtual format. It is the first climate ministerial meeting in the year 2020. The Dialogue was hosted by Germany, and it was co-hosted by the United Kingdom (UK).

Over 30 climate ministers and high-level representatives discussed measures that could pave the way for a green recovery from the economic crisis posed by COVID-19. Discussions also took place on how countries can **move forward with their ambitious climate action plans**, in view of the postponement of UNFCCC COP 26 until 2021.

It was emphasized that even in these times dominated by the corona virus, climate action remains an acute and global challenge. In addition, the ministers made clear that work on ambitious updated **NDCs under the Paris Agreement** will not be put on hold because of the coronavirus. It was informed that 110 countries have announced that they will submit enhanced NDCs, and **121 countries have committed to achieving carbon neutrality by 2050**.

A stakeholder session took place, in which representatives from international organizations, business leaders, ministers, local government leaders, and members of civil society discussed on working together to accelerate **global net-zero, climate-resilient transitions in the power and road transport sectors** in the context of COVID-19.

The **Climate Policy Initiative (CPI)**, ventured ways in which: finance can support a green economic recovery and foster ambitious climate action in the lead-up to COP 26. Some participants stressed that **economic stimulus measures** must enable the achievement of the Paris Agreement and the SDGs.

### India's contributions in the Dialogue

- India stressed on climate finance and urged to plan for **1 trillion USD** in grants to the developing world immediately.
- India highlighted its **Nationally Determined Contributions** spanning a ten-year time frame and in compliance with the temperature goal of the Paris Agreement.
- India focused on the opportunity to **accelerate renewable energy** deployment and create **new green jobs** in the renewable energy and energy efficiency sector.

 **Ajit Singh Choudhary**  
AAO, iCED

## PERFORMANCE AUDIT OF MANAGEMENT OF SOLID WASTE IN GOA

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Solid Waste Management (SWM) is a challenging issue for Goa. A performance audit<sup>11</sup> of '[Management of Solid Waste in Goa](#)' for the period 2013-14 to 2017-18 was conducted in 2018 to assess whether planning for waste management in the State was adequate, efficient and effective waste management systems and monitoring mechanisms were in place.

### Important Audit Findings

- Roles and responsibilities of solid waste management were assigned to bodies which already stood defunct and also understated the estimated total waste generation.
- None of the 191 Village Panchayats (VPs) furnished reports on waste management to State Government agency during the last five years.
- Non-uniform adoption of methodology/ procedures adopted by the ULBs and in non-conform to the procedures prescribed in Section 1.4.3.3.1 of the CPHEEO Manual.

- Absence of supervision by municipal supervisors.
- Beneficiary survey, media reports, etc indicated problems in waste collection.
- Shortfall in inspections by State Level Monitoring Committee
- Dumping of waste along national and state highways.
- Non-availability of adequate processing<sup>12</sup> infrastructure.
- Insufficient landfill sites for proper disposal of waste
- 2.14 lakh tonnes of accumulated waste was not taken up for rehabilitation.
- Absence of plan for disposal of refuse derived fuel and inerts, post-rehabilitation.
- Deployment of vehicles without protective covers and without leachate<sup>13</sup> collection tanks.
- Handling of waste disposal sites in non-scientific manner posing threat to surface and ground water etc.

### Issues in management of other wastes

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<sup>11</sup>[https://cag.gov.in/sites/default/files/audit\\_report\\_files/Report\\_No\\_2\\_of\\_2019\\_Government\\_of\\_Goa.pdf](https://cag.gov.in/sites/default/files/audit_report_files/Report_No_2_of_2019_Government_of_Goa.pdf)

<sup>12</sup> Such as, composting facilities, bio-methanation plants etc

<sup>13</sup> Water that has percolated through a solid and leached out some of the constituents

- Non-existence of Bio-Medical waste (BMW) management plan and Common Bio-Medical Waste Treatment Facility (CBMWTF).
- Non-availability of reliable data on the quantum of Bio-Medical waste generated in the State with the Goa State Pollution Control Board (GSPCB).
- Non-setting up of a Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF) within the State
- Absence of an integrated plan for management and transboundary movement of hazardous waste.
- Majority of hazardous waste generating units (84 per cent in 2016-17 and 76 per cent in 2017-18) did not submit returns to GSPCB.
- Absence of comprehensive BMW collection system in the State.
- The State Government neither had an E-waste management plan nor had a systematic inventory of E-waste.

#### Good Practices

- During 2018-19, Mapusa Municipal Corporation adopted a unique method to stop littering/ dumping at black spots (where garbage is thrown regularly by public at large) by turning 14 such spots into beauty spots.

- For more than a decade, Corporation of the City of Panaji had been composting residential wet waste (currently 1.5 TPD) in decentralised composting stations established in residential societies. After successful trials in February 2019, Calangute Village Panchayat has also decided to replicate this practice.

#### Recommendations

- Promulgation of a holistic policy for management of solid waste as per MSWM Manual, 2016 of the CPHEEO.
- Strengthening of waste collection system and transportation as per Solid Waste Management Rules, 2016.
- Exercising due diligence while awarding cleaning contracts for highways and beaches.
- Timely completion of ongoing projects, scientific rehabilitation of dumpsites.
- A roadmap for common waste treatment and disposal facilities for bio-medical and hazardous wastes.

 **Anil Kumar Beniwal**  
Sr AO, iCED

## **SUKHNA LAKE: A LIVING ENTITY WITH RIGHTS**

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A division bench of the Hon'ble Punjab and Haryana High Court on its own motion vs Chandigarh Administration passed judgement on March 2, 2020 to demolish residential and commercial structures built in the Sukhna Lake catchment area, falling in some parts of Chandigarh, Haryana and Punjab.

### Highlights of Judgment

**The Court directed the States of Punjab, Haryana and Chandigarh UT to**

-  Declare Sukhna Lake as **legal entity/ legal person/ juristic person/ juridical person/ moral person/artificial person** for its survival, preservation and conservation having distinct persona with corresponding rights, duties and liabilities of a living person. All the citizens of U.T, Chandigarh were declared as *loco parentis* as the human face to save Sukhna Lake from extinction.
-  Pay **rupees one hundred crores** each as exemplary/ punitive/ special damages for restoration of catchment area of Sukhna Lake falling in their respective areas.

-  Declare all commercial/ residential and/ or other structures in the catchment area as delineated in the **map prepared by the Survey of India on 21.9.2004**, illegal/ unauthorized, to be demolished within a period of three months.
-  To **issue final Notification** declaring Sukhna Lake as Wetland under the **Wetland (Conservation and Management) Rules, 2017** within a period of **three months** to protect fragile ecology and to support the lake eco system.
-  The **Ministry of Environment, Forest and Climate Change to notify** at least 1.0 km area from the boundary of Sukhna Lake Wildlife Sanctuary as **Eco-sensitive zone** falling in the areas of the States of Punjab & Haryana within a period of three months.
-  Declare the "Naya Gaon Master Plan 2021" and the Development Plan called as Shri Mata Mansa Devi Urban

Complex illegal/void<sup>14</sup> by applying the principle of severability.

- To **completely ban the new construction** in the catchment areas<sup>15</sup>
- To constitute **High Power Committees** to fix the responsibilities of the Officers/Officials, who have permitted such large scale unauthorized construction within a period of four weeks and commence disciplinary proceedings.
- To ensure increase in average capacity by at least about 100-150 Ha. Lower the storage capacity of the check dams for **regular flow of water** into the lake and to avoid seepage losses in the lake.
- That **no waste water/sewage flows** into the river from the villages and removal of **aquatic weeds**.

### Summary

This is a far reaching judgement on protection of watershed and water bodies. Any government authority which ignores the environmental damage caused by unplanned development will have to face

the music. This judgement is an immediate vindication of right over might and will serve as a potent long-term deterrent. The wetland status will boost conservation of the Sukhna lake ecosystem. The decision will help in wetland preservation as well as maintenance of proper water quality and quantity in the lake. The trend of arbitrarily bestowing clearances and permissions for construction activities will be checked and also augment water flow towards the lake.

■ Pavan Kumar Meena,  
AAO, ICED

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<sup>14</sup> To the extent that these Maps/plans cover the areas depicted by Survey of India Map dated 21.9.2004 taken on record in CWP No.7649 of 2003 on 24.09.2004

<sup>15</sup> As delineated in the Survey of India map dated 21.9.2004 falling in the States of Punjab, Haryana and UT Chandigarh as well as in the Sukhna Wetland, Sukhna Wildlife Sanctuary.

## TIGER WATCH – PRESERVATION OF TIGERS (AN INITIATIVE BY VANN GUJJAR COMMUNITY)

The close relationship between humans and nature is an intrinsic part of Indian society. In an era when the natural resources including the wild life are facing numerous threats, it is vital to improve human-animal relationships. In recent times, **human tiger conflicts** have become a frequent issue. Tigers venture out of their territories, in search of prey and create havoc in the adjoining villages. This has set up a stalemate between the animal and the local people. The conflict barges havoc on both sides leading to loss of resources and human lives. Sometimes it is fatal for the tigers too as the suffering villagers strike back by planting traps, hunting or poisoning the tigers. It thus becomes crucial to mitigate the factors promoting conflict and take initiatives to ensure harmonious relation between the local villagers and the tiger population. One such successful initiative has been taken with the help of the Vann Gujjar community residing near the **Ranthambhore National Park** in Sawai Madhopur, Rajasthan.

The members of Vann Gujjar community are nomadic buffalo-herders. Under the umbrella of an **NGO**, this community has formed a

group which act as the **eyes and ears** of the forest department for monitoring and reporting tiger movement in and around Ranthambore. These vigilant volunteers have been trained to set up camera traps, analyzing the pugmarks of tigers and other behavioral characteristics of the animal.



They have set up about 50 camera traps on the periphery of the tiger reserve to monitor the movement of tigers going in and out of the reserve. This monitoring is key as the reserve, being small in size, witnesses a lot of tigers moving outside towards human-dominated areas and sometimes killing livestock.



These group volunteers have become a kind of **protective ring** around the tiger reserve.

They have helped in **controlling poaching** as they have a very strong information network.

A **monthly stipend** is also given to the volunteers which adds to their income. Further they bring forth other issues to the authorities which is then taken up for action timely. The group is involved in **educating the fellow villagers and other communities** regarding the ways in which the habitants can survive in peace with the tigers. A strict vigil and an efficient information gathering network by the volunteers has also led to the arrest of a lot of poachers. The volunteers have provided **useful data and information about other behavior and movement of other wildlife animals and species** inhabiting the National Park. Some of the volunteers also **visit schools around Ranthambore tiger reserve to spread awareness** among the students about the importance of wildlife, forests and environment.

We're not going to successfully realign our relationship with nature if we don't provide the necessary support for people and communities to transition to a more sustainable, ethical means of providing for themselves and their families. It can be achieved by reducing human animal conflict to help stabilize both prey and predator numbers through the provision of sustainable

**environmentally focused permanent wildlife solutions and schemes to reverse habitat destruction.** Such unique initiatives and governments support are the need of the hour as they **involve a symbiosis between NGO, the local community at large and the government authorities** for preserving the shrinking habitats of our National Parks.

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## AUDIT REPORT ON PROTECTION OF VALUABLE FOREST- SWEDISH AUDIT OFFICE

Protection of valuable forest land is an important means of achieving the environmental quality objectives including the objectives of Sustainable forests as well as outdoor recreation. The state can establish formal protection of forest land through the formation of national parks, biotope conservation areas, nature reserves or by signing nature conservation agreements. The Swedish Environmental Protection Agency's is mainly responsible for protection of forest land. The forest owners themselves are also expected to contribute through voluntary set-asides of forests.

### Purpose of Audit

The purpose of the audit was to assess state's efforts to protect valuable forest and voluntary set-asides in achieving the objectives. The audit was conducted based on the following questions:

1. Are state resources for formal protection being used cost effectively?
2. To what extent do voluntary set-asides supplement formal protection?

The important audit conclusion under each question are illustrated below:

### Are state resources for formal protection being used cost effectively?

The Swedish NAO's assessment was that the cost effectiveness of the formal protection work can be improved and to achieve the long term objective, there should be a strategy for the restoration of development land<sup>16</sup>.

Increased knowledge on areas requiring protection is prerequisite for strategic planning and effective prioritizing of areas. As there had not been a comprehensive national inventory of conservation values since 2005.

There was a risk that the protection was more extensive (and more expensive) in certain cases than what was required to fulfil the purpose of the protection. Compensation land can be an effective method to quickly increase the total protection but was not a solution.

Insufficient predictability of the Swedish Environmental Protection Agency's distribution of resources hindered the country administrative boards' to plan long term work.

Environmental maintenance had not been sufficiently prioritized for a long time by the agencies. In the areas requiring maintenance, there was a risk that the values meant to be preserved by the protection will diminish.

### To what extent do voluntary set-asides supplement formal protection?

Efforts from the state were required to be able to assess the complementary contribution of the set-asides. Moreover, conversions of voluntary set-asides to

<sup>16</sup> Land that is able to develop high conservation values.

formal protection need to be clearly motivated, as this can affect the achievement of the objectives.

- Meaning of sector responsibility is unclear, both with respect to how the Government communicates and the agencies act, and how forest owners understand their own responsibilities.
- The state needed to have sufficient knowledge to assess the contribution of the voluntary set-asides to the achievement of the objectives. The state did not had that, especially with regards to quality and sustainability.
- The Swedish Forest Agency's efforts had so far were not sufficient, despite the fact that agency was responsible for the follow-up of the environmental objective Sustainable forests.
- Increased consensus was needed between agencies regarding the motives for conversion. Voluntary set-asides were also converted to formal protection on state land as a result of political decisions. Before such decisions were made, it was important to consider the effect of the conversion on the achievement of the objectives in its entirety.

### Results of Audit

The Swedish National Audit Office's conclusion are as follows:

- The forest protection work so far primarily focused on area objectives and percentages. The work should also focus on the quality and function of the areas.
- For transparent and comparable follow-up and reporting of the objectives, more consensus was

needed around which areas are to be approved.

- Clarification of the meaning of sector responsibility of the state and landowners

### Recommendations:

#### Recommendations for the Government

- An updated, regional analysis clarifying protection needs in different regions.
- Defining of formal protection and voluntary set-asides after 2020.
- Review of possibilities of improving the conditions in which the county administrative boards may able to work more strategically.
- Clarifying the meaning of sector responsibility in terms of the landowner's own responsibility for voluntary set-asides, as well as clarify where the state's responsibility lies and its extent.

#### Recommendations for the Agencies

- Coordination between the Swedish Environmental Protection Agency and the Swedish Forest Agency.
- Communication of the meaning of sector responsibility to forest owners in terms of the division of responsibility between forest owners and the state.
- Establishing a common criteria for ascertaining when a conversion from voluntary set-asides to formal protection may be justified.

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## ENVIRONMENTAL DEGRADATION DUE TO OIL SPILLAGE

Recent incidence of oil spill pollution involving, nearly **20,000 tonnes of Diesel in Russia's Arctic north contaminating the Lake Pyasina** <sup>17</sup> has gained the world news headlines. The leak is a huge threat to the fragile Arctic ecosystem as it is headed to the Arctic sea and **a state of emergency** has been declared in the affected region in northern Siberia. Another incident of **oil spill and fire in Tinsukia region of Assam, India in recent past** also raised concern over the surrounding ecological zones including the **Moguari Motapung Beel wetland, Dibru Saikhowa National Park, Dibru river** which is one of the 1200 "Important Bird and Biodiversity Area" in the world.

The production of petroleum products has risen from **500 million tons in 1950 to 2,500 million tons in mid-1990**<sup>18</sup>. This has led to massive increase in transportation and subsequently, associated oil spill incidents. Some facts are given below<sup>19</sup>:

Oil spill incidents of 7 tonne and above in last few decades		
Decade	No. of oil spills	Oil in tonnes
1990s	358 oil spill incidents	1134000 tonnes of oil lost, 73% of this amount was spilt in just 10 incidents.
2000s	181 oil spill incidents	196000 tonnes of oil lost, 75% of this amount was spilt in just 10 incidents.
Since 2010	62 oil spill incidents	164000 tonnes of oil lost, 91% of this amount was spilt in just 10 incidents. One incident is responsible for about 70% of the quantity of oil spilt this decade.

This is only the trend of major oil spills by oil tankers. The whole dimension of oil spills in the human history can be imagined with the mere fact that the total of top ten spills by oil tankers equals to a mere 1.209% of the **largest oil spill in the Kuwaiti Oil fires in 1991.**

When an oil spill incident occurs major part of its light components **evaporate within a few days.** However, during this period if it comes in contact with any marine life it may prove harmful and sometimes fatal too. If the oil is thick it may **reach the shorelines and result in small oil reservoirs** which may harm the environment. Of course, any oil spill imparts a huge economic loss to the oil companies. But

<sup>17</sup> It serves as the basin for the Pyasina river

<sup>18</sup> <https://www.marineinsight.com/environment/what-is-an-oil-spill-at-sea>

<sup>19</sup><https://www.itopf.org/knowledge-resources/data-statistics/statistics/>

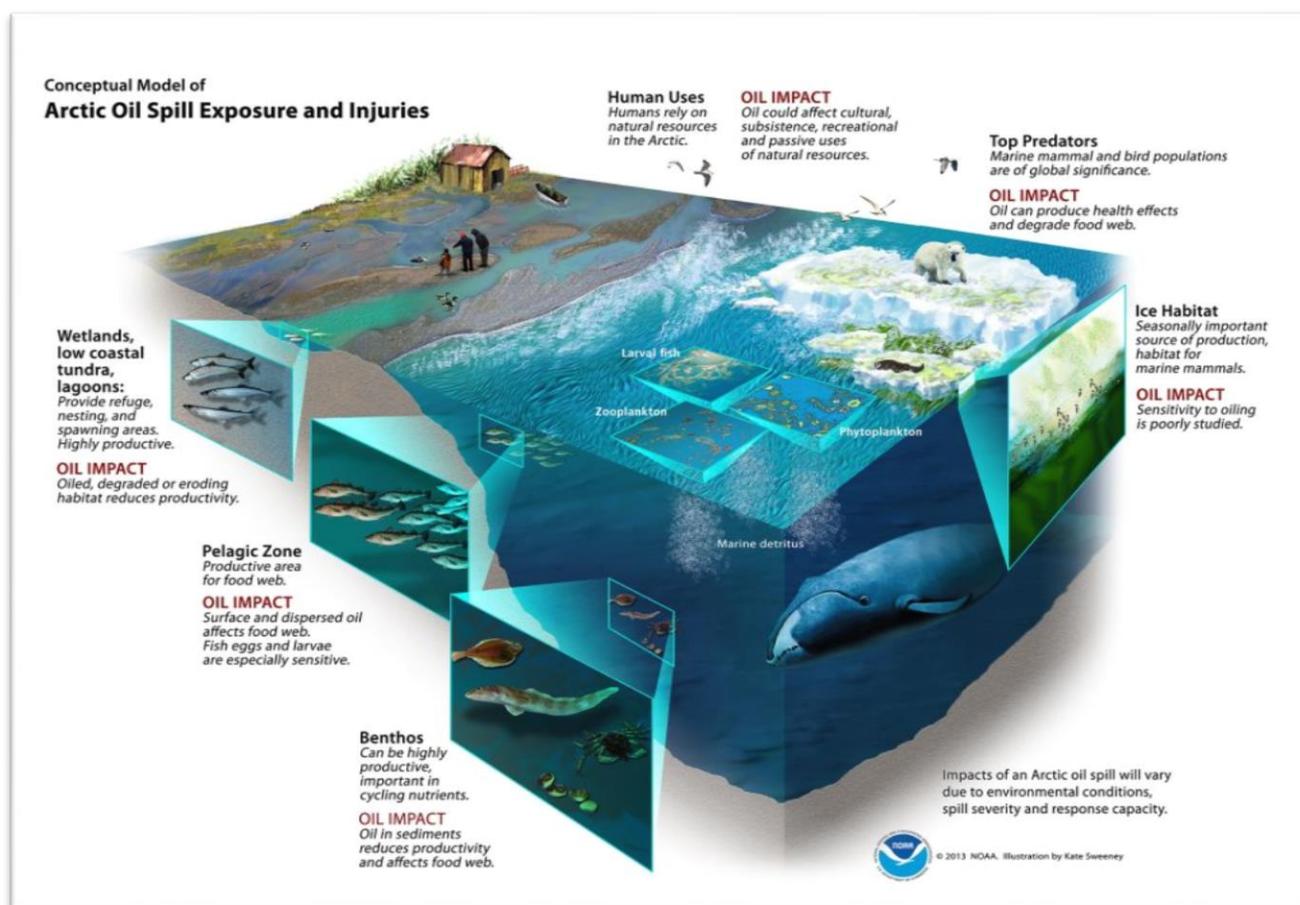
its implications for ecology and environment are critically severe.

## Effects of Oil Spills on Environment

### Fragile Aquatic Ecosystems<sup>20</sup>

Species that rely on fur for regulating their body temperatures are more susceptible to oil spills. Spilled oil **reduces insulating ability** of fur bearing mammals and makes them

vulnerable to the harmful constituents. At many places where there are subzero temperatures, most time of the year, aquatic animals die of **hypothermia**. **Turtles**, usually mistake the spilled oil as food and **inhale** it which further increases the chances of infection in its **mucus membrane inflammation**. In cases where the oil spill reaches the nesting shores of sea turtles, the results could be total **destruction of hatchlings and eggs**.



Arctic oil spill exposure and injuries Infographics (<https://response.restoration.noaa.gov/taxonomy/term/335>)

<sup>20</sup>[https://www.itopf.org/fileadmin/data/Documents/TIPS%20TAPS/TIP\\_13\\_Effects\\_of\\_Oil\\_Pollution\\_on\\_the\\_Marine\\_Environment.pdf](https://www.itopf.org/fileadmin/data/Documents/TIPS%20TAPS/TIP_13_Effects_of_Oil_Pollution_on_the_Marine_Environment.pdf)  
<http://oils.gpa.unep.org/facts/wildlife.htm>

Nearshore **benthos** is the production area for **crabs, shrimps and fish**. Tarmac and oil in these sediments may reduce their productivity and further **effect the food chain**. **Corals** are highly sensitive organisms that may take long time to recover if polluted by oil spills. The aquatic communities which the corals support are also highly susceptible to oil spills. Other consequences of oil spill may result in **decrease in colony viability, damage to the reproductive system of corals, decline of life expectancy of coral larvae and total lack of colonization of corals**.

**Birds** are one of the worst effected creatures of oil spills. The plumage of a bird provides both buoyancy and insulation. It also acts as a medium to trap warmth against the skin. When the birds come in contact with the oil, the **oil damages the insulating and repelling capacity of bird feathers**. At places where there is heavy oil spillage the plumage damage makes it **difficult for the birds to take off**. This restricts the birds to move freely for search of food and also save themselves from predators. Ingestion of oil may cause **dehydration, starvation, arthritis, gastrointestinal problems, infections, pneumonias, and eye irritation**. Oil spilling can reduce or completely alter the invertebrate species which are a main source of many birds. This may **force the birds to prey switching** such switching of prey and habitat can have further conflicts with other predators indigenous to the new habitat. The prey and habitat switching can cause **extra burden on the new habitat** and its dependents.

When exposed to oil, **adult fish** may experience **reduced growth, enlarged livers, and changes in heart and respiration rates**, fin erosion, and reproduction impairment. Oil can make fish and shellfish unsafe for humans to eat. Oil may be taken up by the tissues or surface contamination of other sea creatures like **crustaceans, clams, oysters, and mussels** which are consumed by the local communities residing in that area. This may result in **tainting in sea food organisms** and considerable health risks.

### Wetlands

The oil spill when comes in contact with the wetland plants, **delays the transport of oxygen to the root system of the plants**<sup>21</sup>. This leads to increased stress under which the wetland plants perish. Loss of wetland plants loosens the **sediment grip** and contributes to accelerated loss of wetland areas through **erosion**.

### Mangroves<sup>22</sup>

Mangroves are highly susceptible to oil exposure. Mortality occur within **six months** of exposure and usually within a much shorter time frame (a few weeks). Heavy oil spill in the root system of mangroves may alter the **oxygen supply** and cause the mangroves to perish. The oil spill also interferes with the plant system to maintain the **salt balance** and diminishes their capability to tolerate salt water making the mangroves weak. Commonly observed mangrove responses to oil include **yellowing of leaves, defoliation,**

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<sup>21</sup> [https://response.restoration.noaa.gov/sites/default/files/Oil\\_Spills\\_in\\_Marshes.pdf](https://response.restoration.noaa.gov/sites/default/files/Oil_Spills_in_Marshes.pdf)

<sup>22</sup> [https://response.restoration.noaa.gov/sites/default/files/Oil\\_Spill\\_Mangrove.pdf](https://response.restoration.noaa.gov/sites/default/files/Oil_Spill_Mangrove.pdf)

and tree death. More subtle responses include germination failure, decreased canopy cover, increased rate of mutation and increased sensitivity to other stresses.

### International Conventions<sup>23</sup>

There are various international conventions, set up to facilitate oil spill response and preparedness. None, however, are specifically dedicated to the oiled wildlife community. Some important international conventions related to the subject are given below.

OPRC (1990)	International Convention on Oil Pollution Preparedness, Response and Co-operation. It provided for establishing measures by governments of coastal states for dealing with pollution incidents, either nationally or in co-operation with other countries
OPRC-HNS Protocol (2000)	International Oil Pollution Compensation Funds (OPRC) adopted a protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol).
SOLAS (1974)	International Convention for the Safety of Life at Sea
MARPOL (1973)	International Convention for the Prevention of Pollution from Ships For preventing and minimizing pollution from ships - both accidental and routine operations.
GESAMP (1969)	Group of Experts on the Scientific Aspects of Marine Environmental Pollution Advises the United Nations system on scientific aspects of marine environmental protection

### Conclusion

Good prevention initiatives can go a long way in reducing the risk of pollution from oil spills. However, in spite of best efforts, spills will inevitably occur. When this happens, it is necessary to ensure that effective preparedness measures are in place that will ensure a timely and coordinated response to limit the adverse consequences of pollution

incidents involving oil and hazardous and noxious substances (HNS), or else, the effected ecosystems would take years to regain their original state of order.

Each country has a government agency that takes care of stringent practices, which need to be followed to avoid oil spills and to support immediate action in case of any spill. International key players in the oil and maritime industries, intergovernmental bodies and specific centers of excellence often work together to share experiences and develop guidelines for best practice in responding to oil affected wildlife. With the technological advances from using Geographical Information System (GIS) and satellite imagery to detect the oil spills to advanced communication systems giving timely information about possible oil spill dangers we can further enhance our understanding about the adverse impacts of oil spills on the environment and how to best protect it from oil spill incidents.

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<sup>23</sup> <https://www.oiledwildlife.eu/background-information/international-conventions-and-key-players/key-international-players>

## Article

WE dump it in landfills where plastic degrades and leaches into the soil and groundwater and makes its way to the food chain.

## PLASTIC WASTE MANAGEMENT -A REVIEW OF CURRENT SCENARIO WORLDWIDE

Plastic constitutes an increasingly important fraction of municipal solid waste (MSW). As compared to other packaging materials (iron, aluminum, paper), what is commonly referred to as “plastic” is in fact still a very heterogeneous fraction. The considerable societal benefits of plastics owing to low-cost, easily formable, high-modulus, hydrophobic, bio-inert material finds use in a bewildering range of consumer products. Plastic is a product that takes around 500 to 1000 years to completely degrade due to the presence of complex polymers. It is also estimated that by 2025 the global urban population is estimated to generate more than 6Mt<sup>24</sup> of solid waste daily. Within the Sustainable Development Goals, plastic falls under SDG 12, to: “Ensure sustainable consumption and

production patterns”. Certain targets within this goal also align with the circular economy model, viz; “substantially reduce waste generation through prevention, reduction, recycling and reuse” by 2030. Given these considerations and concerns, management of plastic waste is an important governance issue and public debate.

### Life Cycle

Generally, plastics in the global ecosystem is distributed between three fractions: plastics in use, post-consumer managed plastic waste, and a mismanaged plastic waste (MPW) fraction, the last of which includes urban litter. The mismanaged waste also includes inadequately contained waste such as open dumps and is therefore transportable via runoff and wind which may be collected by street sweepers and concerned citizen groups. Managed waste is generally accounted for and is typically disposed of by incineration or land filling.

### Effects of plastics

The serious concern is the location of mismanaged waste near inland waterways or in coastal regions which serves as an input of plastics in rivers and the oceans. If the dimensions of the plastic is smaller, the risk

<sup>24</sup> <https://www.nature.com/articles/s41599-018-0212-7>.

to microorganisms is high as they are prone to ingest or otherwise interact with them. Micro plastics absorb and concentrate hydrophobic pollutants present in sea water at very low concentrations and these can be bio available to the ingesting species. Around 660 species ranging from seabirds, fish, and bivalves to the zooplanktons at the bottom of the marine food chain, are known to be affected by plastic debris and there is credible evidence of the bioavailability of pollutants concentrated in the plastic to the ingesting organisms<sup>25</sup>.

### Strategies adopted by various nations in dealing with plastic waste

Since the 1980s, many global north countries began to address the matter by adopting legal measures, instruments or punitive actions, but at a slow pace.

Some countries succeeded in tackling the plastic problem, while some took a step ahead before slipping back. Let us take an overview of how various nations are dealing with plastic waste.

Rwanda	A pioneer in banning disposal plastic (2018) among the developing nations, which has transformed into one of the cleanest nations on the globe.
Ethiopia	Ban on importation and production of carry bags thicker than 330 microns

India	<ul style="list-style-type: none"> <li>Carry bags made of virgin or recycled plastic less than 50 microns in thickness have been prohibited.</li> <li>Complete ban on plastic sachets used for packing or selling gutkha, tobacco, etc.</li> <li>India has pledged to ban all single-use plastics by 2022.</li> </ul>
Kenya	Around 500 people have been imprisoned for the offence of distributing or manufacturing plastics and some were fined between Kenya Shillings 50,000 and 150,000.
UK	A policy (to come into effect from 2022) encouraging use of recycled package products among the producers by imposing plastic packaging tax.
Indonesia	In one of the cities of Indonesia used plastic bottles are collected in exchange for free bus ride.
South Africa	MoU is signed by actors in plastic sector to monitor efficiencies of stakeholders' i.e .manufacturers, packaging industries and department of environment affairs to reduce use of disposal plastics.

### Plastic recycling

Since 1950, close to half of all plastic has ended up in landfill or dumped in the wild, and only 9% of used plastic has been adequately recycled. Developed economies have recycling rates around 30%, while developing economies have recycling rates close to 0%. By 2050, it is estimated that 9.9 billion tons of plastic would be available to be recycled<sup>26</sup>.

Primary recycling is often referred to as closed-loop recycling, and secondary recycling as downgrading. Tertiary recycling is either

<sup>25</sup> <https://www.nature.com/articles/s41599-018-0212-7>

<sup>26</sup> <https://recyclenation.com/2017/08/plastic-waste-will-top-13-billion-tons-by-2050/>

described as chemical or feedstock recycling and applies when the polymer is depolymerized to its chemical constituents. **Quaternary recycling** is energy recovery, energy from waste or valorization.

The **global recycled plastics market** reached a value of **US\$ 35.4 Billion** in 2018. The market is further projected to reach **US\$ 50.5 Billion** by 2024. North America enjoys a leading position in the global recycled plastics market on account of ascending demand for recycled plastics mainly due to various initiatives by government and other organizations. It is followed by Europe, Asia Pacific, Latin America, and Middle East and Africa.<sup>3</sup>

### Economic impact of plastic waste recycling



As per, “**Economic Impact of Advanced Plastic Recycling and Recovery Facilities in the U.S**”(2019), of the **American Chemistry Council (ACC)** burgeoning class of recycling and recovery technologies can convert used plastics into a range of products, including raw materials such as **crude oil, chemicals and chemical feedstock’s, transportation fuels** and other **petroleum-based commodities**. ACC found that the U.S. could

support investment in 260 new facilities using these advanced technologies and this could result in increase in direct employments, increase in annual payrolls and additional economic output.

### Reuse of plastic: Some cases from different countries

#### 1. Uganda’s Plastic House



*Construction of houses starts with the process of filling plastic bottles with soil.*

#### 2. Cameroon’s Plastic Bottle boat



*The students in Cameroon are turning discarded plastic bottles into boats.*

#### 3. Sweden’s ReTuna, a Hub of Recycled Products-

*A cycling shopping mall called ReTuna which sells only repaired or up cycled products.*

#### 4. Scotland's walk and ride in Plastic



Company called MacRebur came up with a way to create roads using recycled plastic, which is **stronger and durable** than roads built using asphalt

#### Conclusion

Plastic is ubiquitous. Eliminating it is quite difficult. Recycling is an environmentally and economically virtuous process, but there are factors holding back its expansion in product design, during waste management procedures, and in the ways that recycled products are used. A sustainable recycling sector can only emerge if the very large numbers of actors in the ecosystem, at every stage of the product life cycle, are aligned, or at least able to exert significant influence. This involves manufacturers that produce plastic products, petrochemical companies that produce raw plastic, retailers, consumers, waste managers, city authorities, governments, regulators and NGOs.

It also require robust National Action Plans; establishing and monitoring domestic recycling; incentivizing the recyclers;

promoting sustainable alternatives of plastic; setting criteria and standards for packaging plastics; life cycle and cost analysis of plastic alternatives; elucidating legal rules and cooperation among the local bodies and laymen, among others to bring the change. Besides, spreading awareness and educating consumers about plastic waste, it guarantees a future generation of conscious consumers.

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**WORLD ENVIRONMENT DAY 2020**  
Reality in 7 pics; time to give back to nature  
(Source: Business Standard)

