



Green Files

Newsletter on Environment audit and sustainable development issues

International Centre for Environment Audit and
Sustainable Development (iCED)



Green Files, a quarterly newsletter compiled by iCED Jaipur, is meant for circulation in IA&AD. This newsletter highlights issues on environment and sustainable development which can enable audit offices identify areas of audit concern. It comprises results of recent environmental conferences-national & international; “state in focus” where environment issues in a state are highlighted; critical appraisal of national environmental acts; snapshots of recent news on environment from across India; Supreme Court judgements on environment issues as well as recent national and international audit reports pertaining to environment and sustainable development.

We look forward to your suggestions to make Green Files more relevant. Contributions to the newsletter are also welcome. These can be mailed to iced@cag.gov.in.

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I. IPCC 5th Assessment Report, April 2014

1) Background

The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. It does not conduct any research nor does it monitor climate related data or parameters. IPCC is an intergovernmental body, open to all member countries of the United Nations (UN) and WMO. Currently 195 countries are members of the IPCC. One of the main IPCC activities is the preparation of comprehensive Assessment Reports about the state of scientific, technical and socio-economic knowledge on climate change, its causes, potential impacts and response strategies. Since its inception in 1988, IPCC has prepared 4 multivolume assessment reports and is in the process of finalizing the Fifth Assessment Report to be released in four parts between September 2013 and November 2014. *It will be the most comprehensive assessment of scientific knowledge on climate change since 2007 when Fourth Assessment Report (AR4) was released.* Some of the reports which will form part of the 5th Assessment Report are discussed below.

2) Climate Change 2014: Mitigation of Climate Change

This assesses literature on the scientific, technological, environmental, economic and social aspects of mitigation of climate change.

(i) Approaches to climate change mitigation

- Mitigation is a human intervention to reduce the sources or enhance the sinks of greenhouse gases.
- Effective mitigation will not be achieved if individual agents advance their own interests independently.
- Issues of equity, justice, and fairness arise with respect to mitigation and adaptation.
- Climate policy intersects with other societal goals creating the possibility of co-benefits or adverse side-effects. These intersections, if well-managed, can strengthen the basis for undertaking climate action.

(ii) Trends in stocks and flows of greenhouse gases and their drivers

- Total anthropogenic Green House Gas (GHG) emissions have continued to increase over 1970 to 2010 with larger absolute decadal increases toward the end of this period.
- CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% of the total GHG emission increase from 1970 to 2010, with a similar percentage contribution for the period 2000–2010.
- About half of cumulative anthropogenic CO₂ emissions between 1750 and 2010 have occurred in the last 40 years.
- Annual anthropogenic GHG emissions have increased 2000 and 2010, with this increase directly coming from energy supply (47%), industry (30%), transport (11%) and buildings (3%) sectors. Accounting for indirect emissions raises the contributions of the buildings and industry sectors.
- Globally, economic and population growth continue to be the most important drivers of increases in CO₂ emissions from fossil fuel combustion.
- Without additional efforts to reduce GHG emissions beyond those in place today, emissions

growth is expected to persist, driven by growth in global population and economic activities. Baseline scenarios, those without additional mitigation, result in global mean surface temperature increases in 2100 from 3.7 to 4.8°C compared to pre-industrial levels.

(iii) Mitigation pathways/measures in the context of sustainable development

- There are multiple scenarios with a range of technological and behavioural options, with different characteristics and implications for sustainable development, that are consistent with different levels of mitigation. Delaying mitigation efforts beyond those in place today through 2030 is estimated to substantially increase the difficulty of the transition to low longer-term emissions levels and narrow the range of options consistent with maintaining temperature change below 2°C relative to pre-industrial levels.
- There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified.

(iv) Sectoral and cross-sectoral mitigation pathways and measures

- In baseline scenarios, GHG emissions are projected to grow in all sectors, except for net CO² emissions in the AFOLU¹ sector.
- Infrastructure developments and long-lived products that lock societies into GHG-intensive emissions pathways may be difficult or very costly to change, reinforcing the importance of early action for ambitious mitigation.
- Behaviour, lifestyle and culture have a considerable influence on energy use and associated emissions, with high mitigation potential in some sectors, in particular when complementing technological and structural change.

- **Energy supply:** In the baseline scenarios assessed in AR5, direct CO² emissions from this sector are projected to almost double or even triple by 2050 compared to 2010, unless energy intensity improvements can be significantly accelerated beyond the historical development. Decarbonizing (i.e. reducing the carbon intensity electricity generation) is a key component of cost-effective mitigation strategies in achieving low-stabilization levels.

- **Transport:** The transport sector accounted for 27% of final energy use in 2010, with baseline CO² emissions projected to approximately double by 2050. Technical and behavioural mitigation measures for all transport modes, plus new infrastructure and urban redevelopment investments, could reduce final energy demand in 2050 by around 40% below the baseline.

- **Buildings:** In 2010, the building sector accounted for around 32% final energy use with energy demand projected to approximately double and CO² emissions to increase by 50–150% by mid-century in baseline scenarios. Recent advances in technologies, know-how and policies provide opportunities to stabilize or reduce global buildings sector energy use by mid-century.

- **Industry:** In 2010, the industry sector accounted for around 28% of final energy use with emissions projected to increase by 50–150% by 2050 in the baseline scenarios assessed in AR5, unless energy efficiency improvements are accelerated significantly. Energy intensity of industry could be directly reduced by about 25% compared to the current level through the wide-scale upgrading, replacement and deployment of best available technologies.

- **Agriculture, Forestry and Other Land Use (AFOLU):** AFOLU plays a central role for food security and sustainable development. The most cost-effective mitigation options in forestry are afforestation, sustainable forest management

¹ Agriculture, Forestry and Other Land Use

and reducing deforestation, with large differences in their relative importance across regions. In agriculture, the most cost-effective mitigation options are cropland management, grazing land management, and restoration of organic soils.

- **Human Settlements, Infrastructure and Spatial Planning:** Urbanization is a global trend and is associated with increases in income, and higher urban incomes are correlated with higher consumption of energy and GHG emissions. Mitigation options in urban areas vary by urbanization trajectories and are expected to be most effective when policy instruments are bundled.

3) Assessing and Managing the Risks of Climate Change

(i) Observed Impacts, Vulnerability, and Adaptation in a Complex and Changing World

- In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Evidence of climate- change impacts is strongest and most comprehensive for natural systems.
- In many regions, changing precipitation or melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality.
- Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to ongoing climate change.
- Negative impacts of climate change on crop yields have been more common than positive impacts.
- At present, world-wide burden of human ill-health from climate change is relatively small compared with effects of other stressors and is not well quantified.
- Impacts from recent climate-related extremes, such as heat waves, droughts, floods,

cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability.

- Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty.

(ii) Future Risks and Opportunities for Adaptation

- Risk of death, injury, ill-health, or disrupted livelihoods in low-lying coastal zones and small island developing states and other small islands, due to storm surges, coastal flooding, and sea-level rise.
- Risk of severe ill-health and disrupted livelihoods for large urban populations due to inland flooding in some regions.
- Systemic risks due to extreme weather events leading to breakdown of infrastructure networks and critical services such as electricity, water supply, health and emergency services.
- Risk of mortality and morbidity during periods of extreme heat, particularly for vulnerable urban populations and those working outdoors in urban or rural areas.
- Risk of food insecurity and the breakdown of food systems linked to warming, drought, flooding, and precipitation variability and extremes, particularly for poorer populations in urban and rural settings.
- Risk of loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions.
- Risk of loss of marine and coastal ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for coastal livelihoods, especially for fishing communities in the tropics and the Arctic.
- Risk of loss of terrestrial and inland water ecosystems, biodiversity, and the ecosystem

goods, functions, and services they provide for livelihoods.

(iii) *Sectoral Risks and Potential for Adaptation:* Climate change is projected to amplify existing climate-related risks and create new risks for natural and human systems. Some of these risks will be limited to a particular sector or region and others will have cascading effects. To a lesser extent, climate change is also projected to have some potential benefits.

(iv) *Regional Key Risks and Potential for Adaptation:* This has been assessed for each region and for Asia, has been depicted in Figure 1 below.

Sources:- http://www.ipcc.ch/http://report.mitigation2014.org/spm/ipcc_wq3_ar5_summary-for-policymakers_approved.pdf; http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf

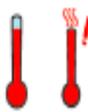
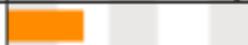
Asia				
Key risk	Adaptation issues & prospects	Climatic drivers	Timeframe	Risk & potential for adaptation
Increased riverine, coastal, and urban flooding leading to widespread damage to infrastructure, livelihoods, and settlements in Asia (<i>medium confidence</i>) [24.4]	<ul style="list-style-type: none"> Exposure reduction via structural and non-structural measures, effective land-use planning, and selective relocation Reduction in the vulnerability of lifeline infrastructure and services (e.g., water, energy, waste management, food, biomass, mobility, local ecosystems, telecommunications) Construction of monitoring and early warning systems; measures to identify exposed areas, assist vulnerable areas and households, and diversify livelihoods Economic diversification 			Very low Medium Very high
			Present	
			Near-term (2030-2040)	
			Long-term (2080-2100)	2°C  4°C 
Increased risk of heat-related mortality (<i>high confidence</i>) [24.4]	<ul style="list-style-type: none"> Heat health warning systems Urban planning to reduce heat islands; improvement of the built environment; development of sustainable cities New work practices to avoid heat stress among outdoor workers 			Very low Medium Very high
			Present	
			Near-term (2030-2040)	
			Long-term (2080-2100)	2°C  4°C 
Increased risk of drought-related water and food shortage causing malnutrition (<i>high confidence</i>) [24.4]	<ul style="list-style-type: none"> Disaster preparedness including early-warning systems and local coping strategies Adaptive/integrated water resource management Water infrastructure and reservoir development Diversification of water sources including water re-use More efficient use of water (e.g., improved agricultural practices, irrigation management, and resilient agriculture) 			Very low Medium Very high
			Present	
			Near-term (2030-2040)	
			Long-term (2080-2100)	2°C  4°C 

Figure 1

II. Tirupur Dyeing Factory Owners Association Vs. Noyyal River Ayacudars Protection Association and Others, Supreme Court, 2009

1) Background of the case

This case arose as a result of Public Interest Litigation (PIL) filed by the Noyyal River Ayacudars² Protection Association, a registered Association for seeking directions for preservation of ecology and for keeping the Noyyal River in Tamil Nadu free from pollution. According to the Association, a large number of industries had indulged in dyeing and bleaching works at Tirupur area and were discharging industrial effluents into the Noyyal. This created water pollution to the extent that the water of the river was neither fit for irrigation nor potable. The pollution also adversely affected the Orthapalayam reservoir and other tanks and channels of the Noyyal River.

A similar issue i.e. menace of pollution had also earlier been raised by another association by filing a writ petition before the Madras High Court which directed the Tamil Nadu Pollution Control Board (TNPCB) to implement the pollution control/ environmental laws and also asked it to impose an amount as penalty that the dyeing units were liable to reimburse for loss caused by pollution. The dyeing and bleaching units were also directed to contribute an amount to meet the expenses of cleaning of the Orathapalayam dam. A period of three months was given for the compliance of this order. The dyeing and bleaching units' Association filed an application for extension of time which was rejected by the Court in April 1998. As a result, the Association of the unit owners approached the Supreme Court by filing Special Leave Petitions. The SC issued

directions in respect of 53 units in Tirupur and 97 units in Karur and as these directions were complied with, these petitions were disposed of in January 1999.

The Government of Tamil Nadu issued order in December 2000 to carry out a study on the restoration of Orthapalayam Dam with the help of the Department of Environmental Sciences of Tamil Nadu, environmental NGOs, and entrepreneurs together with Department of Forests. The study was completed and a report was prepared, according to which, there had been no improvement in the quality of water. Thereafter, the Noyyal River Ayacudars Protection Association filed a Writ Petition before the Madras High Court for the dyeing and bleaching units to clean the river water stored at Orathapalayam dam within a stipulated time with its own expenses, or to recover the expenses which could be recovered from the dyeing and bleaching Units Associations and thereby preventing the pollution of the Noyyal River in future. An interim relief was sought to restrain dyeing and bleaching units from discharging their industrial effluents into Noyyal River.

2) Judgment

The court observed the following:

- Tirupur is an industrial hub providing employment to 5 lakh persons. This is the place exporting finest garments like T-shirts, inner wears to all foreign countries. The competitors are Bangladesh and China. The State Government has granted Sales Tax exemption to the units, considering the importance of the place and taking into account the nature of the industries. The country earns about 10,000/- crores in foreign exchange annually. The industries have provided the means of livelihood to a large number of persons.

² They are responsible for the maintenance of inlet channels, tank bed, tank bund, surplus weirs, sluices and associated structures of a water body.

- It is evident from the record that the High Court issued directions from time to time but the members of the appellant Association had complied with such orders only partly with regard to control of pollution and payment of liability for causing pollution.

- In the case of *Indian Council for Environmental Action vs. Union of India* (1996) this Court ruled that once industrial activities carried out are found to be hazardous or inherently dangerous, the person carrying on such activities are liable to make good the loss caused to any other person by his activity, irrespective of the fact whether he took reasonable care while carrying out his industrial or commercial activities. Therefore, the polluting industries are absolutely liable to compensate for the harm caused by it to villagers or other affected persons of the area, to the soil and to the underground water and hence, the industry is bound to take all necessary measures to prevent degradation of environment and also to remove sludge and other pollutants lying in the affected area. As the liability of the polluter is absolute for harm to the environment, it extends not only to the victims of pollution but also to meet the cost of restoring the pollution free environment.

- In *Vellore Citizens Welfare Forum v. Union of India* AIR 1996 SC 2715; this Court considered various constitutional provisions including Articles 47, 48-A, 51-A(g) and came to the conclusion that it is the duty of the State to protect and preserve the ecology, as Article 21 of the Constitution guarantees protection of life and personal liberty and every person has a right to pollution free atmosphere. Therefore, the "precautionary principle" and the "polluter-pays" principle have been accepted as a part of the law of the land being the part of environmental law of the country.

- Similar view has been reiterated in *People's Union for Civil Liberties vs. Union of India and Another* (1997) ; *AP Pollution Control Board vs. Prof. M.V. Nayudu* AIR 1999 and *M.C. Mehta vs. Union of India* (2001), observing that

environment and ecology are national assets. They are subject to inter-generational equity. The sustainable development principle is a part of Articles 21, 48-A and 51-A (g) of the Constitution of India.

- In *M.C. Mehta vs. Union of India* (2004), this Court explained the scope of "precautionary principle" observing that it requires anticipatory action to be taken to prevent harm. The harm can be prevented even on a reasonable suspicion. It is not always necessary that there should be direct evidence of harm to the environment. The concept of "sustainable development" has been explained that it covers the development that meets the needs of the person without compromising the ability of the future generation to meet their own needs. It means the development, that can take place and which can be sustained by nature/ecology with or without mitigation. Therefore, in such matters, the required standard is that the risk of harm to the environment or to human health is to be decided in public interest, according to a "reasonable person's" test. The development of the industries, irrigation resources and power projects are necessary to improve employment opportunities and generations of revenue; therefore, cannot be ignored. In such eventuality, a balance has to be struck, for the reason that if the activity is allowed to go, there may be irreparable damage to the environment and there may be irreparable damage to the economic interest. A Similar view has been reiterated by this Court in *T.N. Godavaram Thirumulpad vs. U.O.I. & Ors.* (2008) and *M.C. Mehta vs. Union of India & Ors.* (2009).

- In case in spite of stringent conditions, degradation of environment continues and reaches a stage of no return, the court may consider the closure of industrial activities in areas where there is such a risk. The authorities also have to take into consideration the macro effect of wide scale land and environmental degradation caused by absence of remedial measures. The right to information and community participation

for protection of environment and human health is also a right which flows from Article 21.

- The Court directed TNPCB to inspect the Noyyal River and find out whether any pollution is caused by the factories owned by the members of the appellant Association and file a report.

- The Inspection Committee constituted by TNPCB made the observations during inspections:

(A) There is no flow of surface water in the upstream side of Agrahara Puthur road bridge (S1) across the Noyyal River and it was found dry during inspection on 8.7.2009 and 9.7.2009 with isolated ponding of small quantity of water.

(B) Flow of water was observed in Noyyal River at the stretch of Tirupur Town where bleaching and dyeing units are located and downstream at Orathupalayam Dam.

(C) Along with the primary treated effluent from existing bleaching and dyeing units, domestic effluent from Tirupur Corporation, Nallur Municipality and other villages located along the banks of Noyyal River are discharged into Noyyal River, which also contributes to the flow in the River and organic pollution load.

(D) In the entire stretch of Noyyal River falling in the jurisdiction of Tirupur Corporation and Nallur Municipality, municipal solid wastes are being dumped along the river itself, which also contributes to the pollution load in Noyyal. The impact of industrial pollution on river is revealed by the presence of high alkalinity, very high Total Dissolved solids, excess chloride and percent sodium. Also Biochemical Oxygen Demand and Chemical Oxygen Demand are not at an acceptable level. Moreover, the dark red colour of the water in the River Noyyal, was seen during inspection.

- In pursuance of the order of July 09 of the Court, the said Inspection Committee again inspected the 17 Common Effluent Treatment Plans (CETPs) in Tirupur during 3.8.2009 and 4.8.2009 and submitted the Report. The Inspection Committee submitted that among the

17 CETPs, 11 CETPs have completed 90% to 97% works relating to the zero discharge liquid system. The remaining 3 CETPs have completed below 80% of work.

- Members of the appellant Association should ensure the compliance of all the directions including the payment of dues etc., issued by the Court within a period of three months from the day of the order. They shall ensure that no pollution is caused to the river or dam and if cleaning operation has not yet been completed, it should be completed within the stipulated period.

- Undoubtedly, there has been unabated pollution by the members of the appellant Association. They cannot escape the responsibility to meet out the expenses of reversing the ecology. They are bound to meet the expenses of removing the sludge of the river and also for cleaning the dam. The principles of "polluters-pay" and "precautionary principle" have to be read with the doctrine of "sustainable development". It becomes the responsibility of the members of the appellant Association that they have to carry out their industrial activities without polluting the water. A large number of farmers have suffered because of the pollution caused by them. They could not cultivate any crop in the said land. The committee had made a complete survey and assessed the loss and identified the families which are entitled to compensation. Many steps have been taken but the Association has to ensure the compliance of the orders passed by the High Court fully and in order to do, it is desirable that the Association be given three months' time to ensure compliance of directions to make the CETPs functional and pay the balance amount for cleaning the dam and river and meet the compensation to the adversely affected persons within a period of three months. TBPCB is directed to ensure that no pollution is caused and should ensure strict adherence to the statutory provisions.

3) Significance of the judgement

Many cases make links between water, environment and economic development. In *Tirupur Dyeing Factory Owners Association v. Noyyal River Ayacutdars Protection Association*, the Supreme Court restated the central position of the prevention and precautionary principles and of the guiding notion of sustainable development. It acknowledged the central role by Tirupur in the export of fine garments and the contribution of about Rs.100 billion that it makes to India in addition to providing livelihoods to a large number of people. At the same time, it found that on balance there should ensue no pollution to the river and that industrial units must 'carry out their industrial activities without polluting the water'. It noted that it was the responsibility of the polluting units to meet the expenses involved in tackling environmental damage.

Sources:

http://www.stf.jus.br/arquivo/cms/sobrestfcooperacaointernacional/anexo/bd_bric/10.india.pdf;

<http://indiankanoon.org/doc/197754/>;

<https://www.elaw.org/node/5223>

III. The Forest (Conservation) Act, 1980: a critical analysis

1) Background

India's current forest and tree cover is estimated to be 78.29 million ha, constituting 23.81 % of the geographical area of the country (Indian State of the Forest Report, 2011). Forest cover alone amounts to 69.20 million ha., of which 12.06 % is very dense forest³, 46.35 % is moderately dense forest⁴

³ more than 70% crown density

⁴ 40% to 70% crown density

⁵ 10% to 40% crown density

⁶ Means the breaking up or clearing of any forest land/portion for (a) the cultivation of tea, coffee, spices, rubber, palms, oil-bearing plants etc; (b) any purpose other than reforestation; but does not include any

and the remaining 41.59 % is open forest⁵. Forest cover in the country has more or less stabilized since the 1980s. The enactment of proactive forest conservation policies and changes in management approaches from 'timber' to 'forest ecosystem' during the last few decades have curbed deforestation, and promoted conservation and sustainable management of forest. The enforcement of The Forest Conservation Act, 1980 with subsequent amendments enabled the regulation of widespread diversions of forestland for non-forest uses, and hence put a check on deforestation. With the twin objectives of restricting the use of forest land for non-forest purposes, and preventing the de-reservation of forests that have been reserved under the Indian Forest Act, 1927, The Forest (Conservation) Act, 1980 and Forest Conservation Rules, 1981 (now repealed) 2003 were enacted to help conserve the country's forests.

2) Main provisions of the Forest Conservation (FC) Act and its amendments

i. **Restriction on de-reservation of forests or use of forest land for non-forest purpose⁶:** No State Government or other authority can make, except with the prior approval of the Central government, any order directing -

- that any reserved forest/portion thereof cease to be reserved;
- that any forest land/portion thereof be used for any non-forest purpose;
- that any forest land/any portion thereof assigned as lease to any private person, authority,

work relating or ancillary to conservation, development and management of forests and wildlife, namely, the establishment of check-posts, fire lines etc, wireless communications & construction of fencing, bridges and culverts, dams, waterholes, trench marks, boundary marks, pipelines or other like purposes.

corporation, agency or any other organisation not owned, managed or controlled by Government;

- that any forest land/any portion thereof be cleared of natural growing trees for the purpose of re-afforestation.

ii. Constitution of Advisory Committee, penalty for contravention, Offences by authorities and Government Departments

- The Central Government may constitute a Committee for the grant of approval, as discussed above, or for any other matter connected with the conservation of forests.
- Contravention punishable with simple imprisonment for a period which may extend to fifteen days.
- The person who was directly in charge of and responsible to the authority shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly.

3) Main provisions of Forest Conservation Rules, 2003

i. Submission of the proposals seeking approval of the Central Government under section 2 of the FC Act

- Every user agency, who wants to use any forest land for non-forest purposes shall make his proposal in Form A for proposals seeking first time approval under the Act and Form B for proposals seeking renewal of leases where approval of the Central Government under the Act had already been obtained earlier, to the concerned nodal officer authorized by the State Government.
- Every State Government, after having received the proposal shall send the proposal to the Central Government in the within ninety days of the receipt or proposals seeking first time approval and within sixty days for proposals seeking renewal of leases.

All proposals involving clearing naturally grown trees in forest land/ portion thereof for re-afforestation to be sent in the form of Working

Plan or Management Plan. Proposals involving forest land of more than 40 hectares shall be sent by the State Government to Ministry of Environment and Forests (MoEF), Government of India with copy to Regional Office of MoEF. Proposals involving forest land up to forty hectare shall be sent to the Chief Conservator of Forests/ Conservator of Forests of the concerned Regional Office of MoEF.

ii. Committee to advise on proposals received by the Central Government

The Committee shall consider the following matters while tendering its advice on the proposals:

- Whether the forests land proposed to be used for non-forest purpose forms part of a protected area or forms part of any habitat or any endangered/threatened species of flora and fauna or of an area lying in severely eroded catchment;
- Whether the use of any forest land is for agricultural purposes or for the rehabilitation of persons displaced from their residences by reason of any river valley or hydro-electric project ;
- Whether the State Government/any other authority has certified that it has considered all other alternatives and that no other alternatives in the circumstances are feasible and that the required area is the minimum needed for the purpose;
- Whether the State Government/other authority undertakes to provide at its cost for the acquisition of land of an equivalent area and afforestation thereof.
- While tendering the advice, the Committee may also suggest any conditions or restrictions on the use of any forest land for any non-forest purpose, which in its opinion, would minimise adverse environmental impact.

4) Critical Analysis of Act

- The Act is prohibitory in nature. It does not incentivise afforestation/reforestation.

- Act also reinforces state domination over forests and use of forests for commercial purposes. It alienated rights of many adivasi communities that lived in forests or in fringes of forests over the natural resources.
- The Act replaces the State Governments by the Central Government to grant permission for the use of forest land for non-forest purposes. Thus, it has done more towards centralisation of power than bringing in a policy promoting afforestation.
- With the increase in human and livestock population, demand for forest products is also increasing, but the Act does not make any provision to increase the area under forest to meet the growing demand. As a result per capita availability of services through forests in India is decreasing.
- The forestry sector is impacted directly by the policies of other sectors such as agriculture, rural development, panchayati raj, education, energy, and water resources and indirectly by the policies relating to petroleum, chemicals and fertilizers, and industry and commerce. The Act lacks embodying provisions based on a coordinated policy.

5) Interpretation and Implementation of Forest Act, 1980 by the Supreme Court

- The Supreme Court has interpreted and enforced the provisions of FC Act 1980 strictly in T.N. Godavarman Thirumalkpad v. Union of India. The Court issued sweeping directives to enforce the FC Act. All wood based industries were closed and an embargo was imposed on the exploitation of forest and forest product. The Court also created Central and State committees to enforce the directions it issued this case. The court recognized that FC Act was enacted with a view to check ecological imbalance caused by rapid deforestation. The court also defined the word forest used in the FC Act. The Court said the provisions of the act must apply to all the forests irrespective of the ownership or classification thereof. "The word forest must be understood

according to its dictionary meaning". The Court further said any activity going on in any forest in any state of the country which is a non-forest activity is in isolation of the act and has to cease immediately. As a result, all mining, quarrying activities were prohibited in the forest. Wood based industries such as saw mills were also in violation of the Act, it was held. A complete ban was enforced on the felling of trees in all forests, and felling and logging could be carried out only if they are in accordance with the working plans of the State Government only. The Godavarman case represents perhaps the single largest intervention by any court in the world on any single issue. It is presently in its fifteenth year and is now heard two days a week by two separate benches of the court. In the last 15 years over 15 judges heard the cases at different times. It represents in all its myriad form, a unique judicial effort to deal with the deforestation and forest governance issues. It has without doubt given the subject of forest some degree of seriousness in the national policy debate.

- The Courts all over India have followed the Principles laid down by the Supreme Court in Godavarman case. In Shree Bhagawati Tea Estates v. Government of India, the Supreme Court examined a number of issues with respect to the FC Act. Firstly, the court looked at the Kerala Private Forests (vesting and assignment) Act 1971. This act was part of the agrarian reform of the Kerala Government and it sought to acquire private forest lands for this purpose. This acquired land was then to be distributed amongst landless peasants. The petitioner challenged this act by saying that it violated the provisions of the FC Act. It was contended that this acquisition for agricultural purpose would mean clearing of forests on such land, and this was not permissible without the approval of the central government. It was also suggested that the FC Act prohibits the leasing of forest land to private and industries or individuals and therefore, the acquired land could not be distributed to the landless. The Supreme Court dismissed these contentions and stated that the FC act does not envisage a complete ban; only

approval of the Central Government is required. In this case the Supreme Court while upholding the legality of the Kerala Private Forests Act, reconciled with the need to conserve forests with the need to address the livelihood concerns of the poor and the marginalized.

- The Court had also confronted with the issues of mining activities in the forest areas. The court had clearly laid down prohibition of mining activities in the forest areas. The Supreme Court made it categorically clear that renewal of mining licence after FCA came into force can be made only on getting prior permission from the Central Government. The Supreme Court observed “the primary duty was to the community and that duty took precedence, in our opinion, in these cases. The obligation to the society must predominate over the obligation to the individuals.” The Court had firmly disallowed the non-forest activities and granting of lease for non-forest activities in forests. Renewal of stone crushing lease without prior permission of the Central Government was considered a serious breach of duty in the case *Dhirendra Agrawal v. State of Bihar*. The use of forest land for non-forest purpose was clearly denied by the court in the case of *State of Bihar v. Banshi Ram Modi*. Similarly excavations of iron ore and tourism in forest were highly criticised by the Supreme Court.

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[A Critical Analysis. Dr. Madhuri Parikh](#)

IV. Snapshots: Environment news

India, not China, has the world's worst urban air pollution

Of the world's top twenty cities with the worst air, 13 of them are found in India, according to a new analysis by the World Health Organization (WHO).

Despite the attention recently given to Chinese cities for atrocious air pollution, many of India's cities are actually worse when comparing annual averages of fine airborne particulates. Surveying 1,600 cities in 91 countries, WHO found that New Delhi's air was the worst in the world, with 3 other Indian cities—Patna, Gwalior, and Raipur—round out the top four, with Karachi, Pakistan as the fifth worst in the world.

Centre gets 10 days to set up environment super regulator

The Supreme Court on April 25, 2014, has given 10 days to the Centre to set up a national regulator that would take up comprehensive and independent environmental impact assessment (EIA) of projects, enforce conditions for approvals and impose penalties on polluters. The bench had said, “what is required is a regulator at the national level having its offices in all states which can carry out independent, objective and transparent appraisal and approval of projects for environmental clearances and which can also monitor implementation of the conditions laid down in environmental clearances.”

Thermal plants jack up mercury

An Odisha State Pollution Control Board (OSPCB) study revealed that thermal power plants contribute to rise in ambient temperature (temperature of the surroundings) by 2 to 3 degree celsius. Dhenkanal-Angul has five mega thermal power plants, generating about 5,500 MW electricity. At present, temperature is hovering around 40 to 41 degree celsius in the town. The study revealed that the temperature is rising because of burning of coal and lack of green cover. Coal is burnt at 1,200 to 1,400 degree celsius, which leads to rise in ambient mercury level. Secondly, most of the industries have not done plantation in 33% of their areas.

Kanpur Municipal Corporation mulls 'green capsule' to collect garbage in city

The municipal corporation is planning to introduce capsules made of fibre to collect garbage. It is 15X10 ft. in area and collect 12 to 13 tonnes of

garbage. The container would be lifted by a contractor. It would be cleaned and washed at the dumping zone before being put at same place. In the beginning, four to five capsules would be placed at different places to assess the utility. According to official records, the city generates around 1200 tonnes of garbage per day and the contractor and Kanpur Municipal Corporation jointly remove around 1000 tonnes of garbage per day. As a result, 200 tonnes of garbage keeps lying on the roads daily and it accumulates into huge mounds.

Mizoram, Meghalaya reel under heat - Decrease in forest cover raises worry

There has been an exponential increase in temperatures in Mizoram over the past 15 years because of rapid deforestation resulting from 'jhum' cultivation, scientists said. Sources from the state's Science and Technology department said the mountainous state has become warmer by 2.75 degrees celsius over the past one-and-a-half years, against the average global surface temperature of 0.6 to 2.5 degrees celsius. The main cause of the rapid increase in temperature is the ecological imbalance caused by unplanned urbanisation, rather than the greenhouse effect, which generally is the main cause in the rest of the world. Meghalaya, too, is grappling with global warming.

Delhi's water bodies face threat of extinction

A survey released by the Delhi Parks and Gardens Society (DPGS) has revealed that of the 611 water bodies in the Capital, 274 have already dried up and as many as 190 have been lost forever and cannot be revived. The Municipal Corporation of Delhi and Delhi Development Authority are busy minting money by selling the dry water bodies to private companies, allowing them to construct on the land.

Indian activist Ramesh Agrawal wins "green Nobel" for fight against coal mining

Environmental activist Ramesh Agrawal, who helped villagers stop a massive coal mining project, is among six people around the world to be awarded the prestigious Goldman Environment Prize. With a small internet cafe as his headquarters, Ramesh Agrawal organised villagers to demand their right to information about industrial development projects and succeeded in shutting down one of the largest proposed coal mines in Chhattisgarh. Agrawal's work made him a target for mining industry supporters.

Court bans use of earth movers for sand mining

The Madurai bench of the Madras high court banned use of earth movers and other machinery for mining of sand in 18 quarries in Cauvery and Coleroon rivers in Karur, Trichy and Thanjavur areas. The order may have far-reaching economic implications as price of sand could go up because of higher costs involved in manual mining of sand. In line with the MOEF guidelines, the court has also banned in-stream mining of sand.

PMC directed to deposit Rs.6.40 cr collected in fines for tree felling

The National Green Tribunal (NGT) has asked the Pune Municipal Corporation (PMC) to deposit Rs.6.40 crore collected by the civic body as fine from people for felling trees illegally in the city, in an escrow account. PMC will not be allowed to utilize this amount unless specifically directed by the NGT.

Court orders CPCB to study pollution in mining belt, river

Dissatisfied with the State government's approach to handle pollution challenges in chromite mining belt of Sukinda and River Brahmani, the Orissa High Court in May 2014 directed the Central Pollution Control Board (CPCB) to conduct an independent study to ascertain the level of pollution in the area. The court also ordered the CPCB to look into pollution of the Brahmani.

700 fish die in Rewalsar Lake

More than 700 fish have died in the past three days in May 2014 at Rewalsar Lake situated in the Rewalsar town of Mandi district. According to local residents, the death of fish is a regular feature here as thousands of devotees overfeed them during Tsheshu and Baisakhi festivals. They said the leftover food contaminated the water as a result of which the dissolved oxygen level went down and the fish started dying. The Irrigation and Public Health Department had removed vegetation from around the lake which used to act as a natural filter and stop impurities from flowing into the lake directly. Due to ineffective drainage system, the polluted water of the town flows directly into the lake. Also no one wants to kill the fish in the pond as they consider it unholy, as a result the population of fish had increased manifold.

Veggies full of river toxins

The recent plea in National Green Tribunal in May 2014 by Yamuna Jiye Abhiyan suggests large scale pollution of Yamuna from industrial effluents and sewage that has led to groundwater pollution and soil pollution. It quotes various studies including a 2012 The Energy and Resources Institute (TERI) study that found the level of toxic metals like nickel, lead, manganese, chromium and zinc high in many water samples. At one locations, lead levels were 10 times more than those anywhere else in the river and at another location near a thermal power plant, mercury concentration was about 200 times more than United States Environmental Protection Agency standard. It also quotes a 2012 study that found Lindane, a carcinogenic insecticide in Yamuna water.

Walls choke mangroves in Navi Mumbai's wetlands

Mangroves in the city are slowly dying with cement walls coming up around them, say activists. Concrete barricades are visible near the wetlands between Mansarovar and Kharghar stations and in Sector 20 of Airoli. In Sector 20 of Airoli, near the MSEB office, all the barricaded

mangroves have dried. In its judgment of October 6, 2005, the Bombay high court ruled that mangroves were protected forests and there should be a total freeze on any construction in and around them and also zero debris dumping in coastal regulation zones.

Forest department in Karnataka eyes CSR funds to enhance green cover

The new Corporate Social Responsibility (CSR) Rules which came into effect from April 1, 2014, as part of the Companies Act, 2013, provide that every company, private or public limited, which has a net worth of Rs.500 crore or a turnover of Rs.1,000 crore or net profit of Rs.5 crore, should spend at least two % of its three-year annual net profit on corporate social responsibility activities.

In Aravalis, bid to make profits on 0.5% of land

The question being asked is why is urban development minister Kamal Nath pushing for the Aravalis to be declared a Natural Conservation Zone (NCZ) even while this move has been opposed tooth and nail by both the ministry of Environment and Forests (MoEF) and the PMO. Giving the Aravalis NCZ nomenclature will allow for construction of 0.5 % of land for tourism purposes. Prime forest land is spread across ten lakh hectares and 0.5 per cent of this land will work out to 500 hectares, worth Rs.50,000 crore.

Source: <http://www.indiaenvironmentportal.org.in>

V. State in Focus: Maharashtra

Maharashtra, the third-largest state in the country, covers 3, 07,690 Sq. kms or 9.84% of the total geographical area of India and third largest state by area in India. According to the provisional results of the 2011 national census, Maharashtra is the second most populous state in India. It is bordered by the Arabian Sea to the west, Gujarat and the Union territory of Dadra and Nagar Haveli to the northwest, Madhya

Pradesh to the north and northeast, Chhattisgarh to the east, Karnataka to the south, Andhra Pradesh to the southeast and Goa to the southwest.

1) Environment scenario

a) Forests

According to the State of Forest Report, 2011 (SoFR), the recorded forest area of the state is 16,939 km² which is 20.13% of the geographical area. Reserved Forests constitute 79.5%, protected forests constitute 13% and Unclassed forests 7.5 % of the recorded forest area. The report shows that there has been a decrease of 3 km² in the very dense forest, 19 km² in moderately dense forest and an increase of 18 km² in open forests. The total area of mangroves in India is about 6,740 sq. km, which is about 7% of the world's total area of mangroves. Around 20 out of the 35 species of mangroves found in India have been reported from the Maharashtra coast and 12 of these species are found in Mumbai.

As per the "State of Forests Report - 2011", published in January, 2012 by Forest Survey of India (FSI), the mangrove cover in the Maharashtra stands at 186 square kilometre, which includes mangroves standing on private as well as public land. All over the world, mangrove ecosystems are under severe threat. Several competing land use options make mangrove land extremely vulnerable to development pressures, while the utility of mangrove trees as timber, fuelwood, fodder etc., lead to their unsustainable harvest.

Some of the major issues that threaten the mangrove forests include:

- Change of land-use pattern: Development and change of land-use pattern along the coastal areas has a negative influence on mangrove habitats. Mangrove areas are generally cleared for real estate development, industrial activities, infrastructure

development, aquaculture, salt pans and for tourism related activities.

- Pollution: Untreated effluents from industrial units and pollution from waste disposal sites that get discharged into the rivers and creeks kill marine organisms that live within the mangrove forest. Oil spills are also known to smother mangrove roots and pneumatophores⁷, thereby killing the mangroves.
- Deforestation: The use of mangrove species for firewood, construction, pulp production, charcoal production and animal fodder also threaten the species. While harvesting of mangrove forests has taken place for centuries in some parts of the world, it is no longer sustainable and threatens the future of the forests.
- Increased sedimentation: Erosion of land due to deforestation and dumping of soil and construction debris increases the amount of sediments around the creek areas. This leads to smothering of pneumatophores and reduce their breathing and filtering capacity, which ultimately result in the destruction of the mangrove ecosystem.

b) Biodiversity

Maharashtra houses a large number of animal species including the tiger, crocodile, bison, neelgai, wild deer, sambar and rare migratory birds. The State is a home for 27, 22 and 42 % of mammals, reptiles and birds respectively, found in India. The State has variety of flora and fauna consisting of about 3500 flowering plants, 85 mammals and 460 bird species. There are varying physiography, geological features and forests ranging from the tropical wet semi evergreen to tropical dry deciduous forests and grasslands. There are a variety of wetlands extending over 3007 km² of which 216.75 km² are natural wetlands in the State. Seven of the 25 bio-geographic provinces in India, identified by the Wildlife Institute of India, exist in Maharashtra.

⁷ A specialized structure developed from the root in certain plants growing in swamps and marshes, serving as a respiratory organ.

- The State has 6 National Parks and 36 Wildlife Sanctuaries with a total of 15,732 sq km area, amounting to 5.02% of the State's geographical area. Maharashtra has four major Tiger Reserves: Melghat Tiger Reserve (Amravati District); Pench Tiger Reserve (Nagpur District), Tadoba-Andhari Tiger Reserve (Chandrapur District) and Radhanagari- Koyna Tiger Reserve (Sahyadri Tiger Reserve). The Western Ghats including those in Maharashtra are under consideration for inclusion as a World Heritage Site. These biological treasures represent diverse vegetation types and the forests in their climatic conditions form a unique Biological Heritage. There are 386 sacred groves in Maharashtra under different agencies.

- The hotspot of biodiversity in Maharashtra is to be found in the Western Ghat region, which is considered as one of the most important biogeographic zones of India, as it is one of the richest centres of endemism. Due to the varied topography and micro-climatic regimes, some areas within the region are considered to be active zones of speciation⁸. About 1500 endemic species of dicotyledonous plants are reported from the Western Ghats. Biological diversity stems from a variety of habitats, which mainly include virgin or less disturbed forests, scrubs woodland, thickets and grassland.

- The Institute for Ocean Management has identified Ratnagiri and Malvan as ecologically important areas in the state. Encroachment of national parks for commercial and poaching activities is a major problem, which needs adequate attention. Timber factories are not effectively regulated and contrary to the Supreme Court's orders carry on their activities resulting in large scale felling of trees.

- The Salim Ali Lake in Aurangabad is ecologically a very important lake and is visited by about 25 to 30 species of migratory birds, like the European-Pintale, Lodkha-Chakrawak, Siberian-Vision, Black Wing Stilt, Painted Stork, Spoonbill,

Brahmin Kayta etc. However, due to the dumping of domestic waste and sewage the ecology is under threat. The Karnala bird sanctuary, which is about 11-km south west of Panvel town, has a rich habitat of valued fauna, largely birds. Until recently, this bird sanctuary had the status of wildlife sanctuary, which was brought down to the status of the mere forest by the government authorities. The ecology of this entire area is on the verge of deterioration, owing to rapid urbanisation in the surroundings and other development processes.

- Some of the threatened mammalian species are Sinhagad rat, blue whale, sea cow, all critically endangered. Some of the endangered bird species are Forest Owlet, Lesser Adjutant, Great Indian Bustard, Lesser Florican, Nilgiri Wood-Pigeon, Broad-tailed Grass-Warbler, Indian white-backed vulture and Long-billed vulture etc. Among Amphibians, Amboli toad, Indirana phrynoderma, Pseudophilautus amboli frog etc., are endangered. Among reptiles, 2 kinds of sea turtles Eretmochelys imbricate, a sea turtle found in Maharashtra, Orissa and Tamil Nadu coast and Dermochelys coriacea, a sea turtle found in Maharashtra, Andaman, Goa, South Kerala, Gujarat and West Bengal are engendered, among other species.

c) Waste management

Solid waste management

According to Maharashtra Pollution Control Board (MPCB), the state generated 18918.98 metric ton per day (MT/day) of Municipal Solid Waste (MSW). Some of the issues related to waste management in Maharashtra are as follows:

- Collection of waste is poor, community bin system of waste collection is adopted wherein the storage bins are located along the roadside/street in residential, business and commercial areas. In most of the cities, the design, location and capacity of community bins is not appropriate both in terms of population they serve and quantity of waste generated in the area of their location. Further, the

⁸ the formation of new species as a result of geographic, physiological, anatomical, or behavioral factors that

prevent previously interbreeding populations from breeding with each other.

frequency of collection and transportation of wastes is not satisfactory.

- There are 257 Urban Local Bodies (ULBs) in Maharashtra; 165 ULBs have an authorised site for waste disposal, 88 ULBs have a waste processing facility. However, out of a total generation of 18918.98 mt/day generation, only 6282 MT/day (33%) gets treated. Out of 26 Municipal Corporations, 24 ULBs have authorised site, 13 ULBs have treatment facilities and 36 % (5776 MT/day out of 16078 MT/day generated) of MSW gets treated. Out of 231 Municipal Councils, 141 ULBs have authorised site, 75 have treatment facility, only 18 % of generated MSW waste gets treated. As such, the treatment of MSW is a big issue.

- A health assessment survey of 174 people residing adjacent to Gorai dumping ground in Mumbai revealed that the incidence of asthma in the studied population was 9.2 %, which is higher than the noted prevalence of 3.5 % among the general population of the city. About 16.8 % and 47.3 % of the studied population suffered from allergic rhinitis and eye irritation and headache, respectively (BMC, 2004). Thane-Belapur industrial belt in Navi Mumbai creates more than 100 tonnes per day (TPD) of solid waste, most of which is highly toxic. Possibility of unauthorised dumping of this waste in the rivers is high. Plastic waste sorted out from MSW by rag pickers recycled without proper technology gives rise to highly toxic fumes. It was reported that burning of waste at the Deonar dumping ground in Mumbai caused sickness among nearby residents, resulting in a public interest litigation (PIL) forcing the Municipal Corporation to make some improvements.

Biomedical waste management

- According to MPCB, the amount of bio-medical waste (BMC) generated in Maharashtra is 3740.15 kgs per day out of which 2437.19 kgs per day get treated. There are 47560 health care facilities in Maharashtra, 21 Common Bio-Medical Waste Treatment Facilities and 9558 health care facilities have their own treatment facilities.

- The data for 2001 shows that Konkan division accounts for 45.40 % of BMW generated in the State while Pune and Nagpur account for 18.13 % and 11.21 %, respectively. Nashik accounts for 9.65 %, Amravati for 7.65 % and Aurangabad for 7.95 % of BMW.

- There are several problems which still exist in managing BMW. Despite the BMW Rules coming into effect, the major hospitals in Nagpur and Wardha were not abiding by them. It is reported that hospitals and authorities suffer from many issues such as shortage of trained manpower and field officers who can ensure that the hospitals are fully aware about the management of hospital waste. Further, in cities like Mumbai, land prices are sky-rocketing, and small hospitals cannot afford to have their own treatment plants.

Hazardous waste

In response to a Public Interest Litigation filed by Research Foundation for Science, Technology and Natural Resource Policy, 1995, Supreme Court passed an Order dated 14.10.2003, directing each State Pollution Control Board to prepare a fresh inventory of HW generation in their state and submit the same to The Central Pollution Control Board. MPCB, through a commissioned study in 2012, assessed that 18,05,292.66 Metric Tonnes Annum (MTPA) of hazardous waste was being generated in Maharashtra of which about 29% is landfill-able, 57% is recyclable and balance 14% is incinerable. A total of 5511 authorizations were granted to Hazardous Waste generating units in Maharashtra State. Maharashtra has a total of 4 Treatment and Safe Disposal Facilities (TSDFs), out of which 3 have secured landfill facility as well as common incinerator facility. The 4 TSDFs have a total capacity to treat 25,000 Tonnes Per Annum (TPA) but the amount generated is 5, 68,135, leaving a deficit of 3,18,135 TPA which remains untreated, potentially causing harmful effects to health and environment.

E waste

Among Indian cities, Mumbai ranks first among top ten cities generating E waste in India. Along with Mumbai, Pune also ranks among the top Ten Indian Cities, which are repositories of E-waste. Mumbai, the financial nerve centre of India, is also India's largest port city. The Mumbai-Pune industrial belt is one of the electronic items manufacturing hubs of the country. As a result, Mumbai is not only the port of import for new and used electronics; it is also home to a large user and manufacturer base, both generating large volumes of e-waste. The analysis of data shows that the E-waste generation exceeds 23, 000 tonnes /year in Mumbai, while it exceeds 1900 tonnes in Pune, Pimpri Chinchwad region. The E-Waste arriving in Mumbai exceed 24,000 tons. This figure does not include imports. The analysis of data shows that E-waste in Mumbai region exceed 50,000 tons and 3500 tons in Pune, Pimpri Chinchwad region by 2015. Most of the activity in Mumbai, Pune and Pimpri Chinchwad region involves physical dismantling by hammer, chisel, screw driver and bare hand. The most high- tech piece of dismantling equipment witnessed was an electric drill. There is no organized mechanism for collection, transportation and disposal of E-Waste in Mumbai, Pune, and Pimpri Chinchwad region. No mechanism exists in the state to monitor and track its inventory, collection, transportation and disposal. Field Investigations reveal that easy and approachable method for disposal of e-waste in Mumbai is throwing in municipal dustbin which goes for land filling sites. E-waste is emerging as major problem in the state which will pose major environmental risk due to exponential increase in generation by 2015. No mechanism exists in the state to collect, transport, dismantle and dispose e-waste. No scientifically designed facility exists in the state for its safe dismantling and disposal. Lack of institutional mechanism to track and monitor its collection, transportation, disposal and inventorization. As such, it has major potential to cause long term health as well as environment impacts.

d) Water issues

Coastal zone

Many MNCs and large Indian companies are dependent on import-export activity and they are particularly interested in coastal locations of the State because sea-coast provides port facility, water supply and space for waste disposal. Moreover, Konkan Railway and new coastal highway, which is under construction will provide strong land link to the other parts of the country. The State has over 720 kms of coastline with two-major ports-Mumbai Port Trust (MPT) and Jawaharlal Nehru Port (JNPT) in the Mumbai Metropolitan Area and 48 minor ports. The State Government has announced privatization of all the 48 ports by giving the existing port facilities on lease acquiring additional land for the private companies.

Ecologically sensitive coastal lands in the State are still owned by Khots (absentee landlords) who sell off land dispossessing peasant cultivators. In Ratnagiri district, Maharashtra Industrial Development Corporation forcibly acquired about 650 hectares of land at Anjanwel-Veldur for Dabhol Power Company, 800 hectares for the Hindustan Oman Petroleum Corporation, and 7200 hectares of land along Dabhol creek. But these lands are very rich in horticultural products and in export potential of fruits, spices and marine wealth are being destroyed now by handing over the lands and the ports to MNCs even when there is opposition from the local peasants and fisher-folks. Due to the encouragement from the State Government, these activities are being accelerated despite the fact that they are in contrast to the Coastal Regulation Zone (CRZ) Notification of 1991 by the GOI, prohibiting such activities in coastal areas. Due to negligence, this is resulting in environmental degradation like coastal erosion, coastal flooding, salt-water intrusion, extinction/destruction of the marine fauna, etc., threatening the livelihood of thousands of local farmers and fisher folks. The State level Maharashtra Coastal Zone

Management Authority was constituted by the Ministry of Environment & Forests under Environment (Protection) Act, 1986. The Authority has the power to take the necessary measures for protecting and improving the quality of the coastal environment and preventing, abating and controlling environmental pollution in the coastal areas.

Surface water pollution

None of the Regional Officers of MPCB have prepared databases of the pollutants, sources of the same, pollution loads, as a result of which, risks to the environment and health caused by water pollution cannot not be assessed by MPCB. MPCB has not initiated any action to prepare a river health booklet or identify any river for pilot study for abatement of water pollution. There is no mechanism in place for monitoring the validity period of the consents granted to various industries by the Maharashtra Pollution Control Board. In 18 urban local bodies, domestic effluents were discharged without any treatment. There were 14,737 water pollution-prone industries in the State of which 1726 industries had only partial effluent treatment facilities and 356 industries had no effluent treatment facilities. Common Effluent Treatment Plants and Effluent Treatment Plants were found inadequate to treat industrial effluents and the treated effluents exceeded the consented standard of Chemical Oxygen Demand and Biological Oxygen Demand. Due to non-completion of the works under the National River Conservation Programme, untreated sewage water (around 27 million litres per day) was being discharged into the Krishna River at Sangli. At Nanded, though the work had been completed, the entire untreated sewage/waste water (60 MLD) was being directly discharged into the Godavari River due to non-commissioning of the sewage treatment plant. Since 2000-06, 23 polluted river stretches were identified by CPCB which further increased to 28 by October 2010. A report submitted before the Parliament by the

Union Irrigation ministry has shown that a whopping 28 polluted rivers flow through Maharashtra. These rivers are: Bhima, Godavari, Mula, Mutha, Pauna, Panchaganga, Patalganga, Indrayani, Koyna, Kundalika, Kanhan, Kolar, Mithi, Tapi, Giran, Neera, Wainganga, Wardha, Krishna, Purna and Chandrabhaga. The worst polluted among these are the ones in the industrial belts of Raigad district, with Patalganga being the most polluted river. The report categorically blames the direct release of untreated industrial effluents into the waters for the state of affairs.

Groundwater

Groundwater is used as an important supplementary source of water in certain parts of the Mumbai Metropolitan Area, such as Vasai, Virar, Bhiwandi, Kalyan, Ulhasnagar, Thane, Alibag, Pen and Panvel areas. The coastal areas of Vasai-Virar region have a large number of wells, which supply water for domestic as well as irrigation purposes. The rapid growth of urban development in this region and inadequacy of piped water supply has led to over abstraction of water from these wells. This has resulted in the intrusion of seawater into the underground reservoir affecting the quality of the well water. Apart from this, groundwater in certain parts of the region is polluted on account of microbial contamination and excess concentration of nitrates. The groundwater analysis of Mira-Bhayander Municipal Corporation (MBMC) showed that the water was contaminated or harmful to health, and hence, not potable (MBMC, 2004). In Navi Mumbai, sampling revealed organic pollution in well waters at Belapur and Shirvane necessitating frequent controlled chlorination (2004). Analysis of groundwater in Ichalkaranji indicates that the water at most places is hard. When compared with the World Health Organization (WHO) and ISI guidelines for drinking water, most of the tube well water is contaminated, hence, unsuitable for drinking.

(e) Air Pollution

Being a highly industrialised state, urban areas of Maharashtra have numerous air pollution sources, which have deteriorated air quality of many cities. Based upon the observations of air quality of the seven major cities by CPCB, it is indicated that the air quality in Mumbai is critical in terms of RSPM⁹ and SPM¹⁰. Air pollution levels of some important cities of Maharashtra were compared with those of India. Among these cities Calcutta recorded the highest NOx¹¹ levels followed by Solapur and Ahmedabad. The SPM levels in Solapur exceeded the standard limit. SPM constitutes a major fraction of SPM in residential areas of Nagpur. The time-series emission load for Mumbai city indicated that the CO¹² and HC¹³ emission levels are steadily increasing over the years. Air quality data monitored by various industries in different regions of Maharashtra for the year 2003-2004 was analysed for different regions, viz. Amravati, Aurangabad, Thane, Mumbai, Kolhapur, Kalyan, Navi Mumbai, Nashik, Nagpur, Pune, and Raigad. The data was available for 91 monitoring locations, falling under Residential (10), Commercial (28) and Industrial (53) activity zones. In most of the cities/towns the RSPM, SPM and PM10¹⁴ levels are found to exceed CPCB standard of 200 µg/m³ (micrometres per cubic meter) and 100 µg/m³, respectively. Concentration levels of SO² (sulphur di-oxide) and NOx are well within the CPCB standard of 80 µg/m³. Analysis of long-term as well as short term air quality data available for the different cities/towns/regions

⁹ Respirable Suspended Particulate Matter (RSPM): suspended particles in the air that are 10 micrometres or less

¹⁰ Suspended Particulate Matter (SPM): all airborne solid and low vapour pressure liquid particles.

¹¹ NOx is a generic term for mono-nitrogen oxides. They are produced from the reaction of nitrogen and oxygen gases in the air during combustion, especially at high temperatures. In areas of high motor vehicle traffic, such as in large cities, the amount of nitrogen oxides emitted into the atmosphere as air pollution can be significant.

of Maharashtra indicate that SO² and NOx are well within the permissible limit of CPCB. However, a higher level of SPM/PM10 is observed in almost all the cities/towns. A study conducted by National Environmental Engineering Research Institute (NEERI) showed that the power plants and chemical industries were the major sources of industrial emissions. The contribution of power plant to the industrial Total Suspended Particles (TSP), SO² and NOx emissions was reported as 63, 21 and 46 % respectively.

2) Laws and Policies

The principal laws on environment in force in Maharashtra state are given below-

- Maharashtra Private Forest Acquisition Act 1975
- The Maharashtra Protected Forests Marathwada or Konkan or Western Maharashtra Rules 1998
- The Maharashtra Felling of Trees Regulation Act 1964
- Forest Right Rules 2007
- The Maharashtra supply of Forest Produce by Govt Revision of Agreement Rules 1983
- The Maharashtra Forest Protection of Forests from Fire Rules 1982
- Grazing Rules for the Maharashtra State
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Rules, 2007
- Tendu Rules 1969
- Wildlife Protection Maharashtra Rules 1975
- The Maharashtra Forest Produce Regulation and Trade Act 1969

¹² Carbon Monoxide: CO is an odorless, tasteless and colorless gas produced by the incomplete burning of materials which contain carbon, including most transport fuels.

¹³ Hydro Carbons: They are produced by incomplete combustion of hydrocarbon fuels, and also by their evaporation

¹⁴ Particulate Matter (PM10) particles (the fraction of particulates in air of very small size (<10 micrometer) are of concern, as they are small enough to penetrate deep into the lungs and so potentially pose significant health risks.

- Forest Right Act Scheduled Tribes and Other Traditional Forest Dwellers Recognition of Forest Rights Act 2006
- Maharashtra M.F.P. Regulation of Trade Act 1969

3) Environment Sustainability Index (ESI)

Environmental Sustainability Index (ESI) is a comparative analysis of environmental achievements, challenges and priorities among Indian states. It aggregates quantitative data on states' initial endowment and resource use trajectory, magnitude of pollution and its impact on human health & ecosystem vitality, policy & societal response to maintain and improve present environmental conditions into a composite index that provides the overall picture of state-level sustainability. ESI measures the potential of states to maintain their environment in the coming decades given the various environmental resources that a state is endowed with. Dimensions of sustainability both as historical conditions and present efforts are mapped through 40 indicators in 28 states of India. Maharashtra ranks 17th out of 28 states for which ESI is measured as depicted below:



Source:

<http://www.mahaforest.nic.in/index.php>;
<http://moef.nic.in/soer/state/SoE%20report%20of%20Maharashtra.pdf>;
<http://mpcb.gov.in/>;
<http://indiasendangered.com/maharashtra%E2%80%99s-biodiversity-revealed/>;
http://ibcn.in/wp-content/uploads/2011/12/29-691_734-Maharashtra.pdf; www.cpcb.nic.in

VI. Audit Report: Social, General and Economic Sectors (Non-PSUs) for the year ended 31 March 2013, Jammu and Kashmir: National Rural Drinking Water Programme

1) Background

Accelerated Rural Water Supply Programme (ARWSP) launched on all-India basis in 1972-73, is one of the six programmes of "Bharat Nirman" launched by the Union Government in 2005-06 and aimed at provision of rural infrastructure and minimum basic amenities. The scheme was renamed as "National Rural Drinking Water Programme" (NRDWP) with effect from 01 April 2009. The prime objectives of the programme are ensuring drinking water security to every rural household by utilizing multiple sources of water, ensuring the sustainability of the system, institutionalization of water quality programme through community participation, creation of awareness among masses, training of manpower and ensuring transparency in implementation through online Management Information System (MIS). The main

components of the programme are coverage of uncovered/partially covered areas; sustainability of sources and systems; operation & maintenance of schemes, water quality and support activities. The programme guidelines provide for creation/ establishment of various institutions like State Water and Sanitation Mission (SWSM), State Level Scheme Sanctioning Committee (SLSSC), State Technical Agency (STA) and Water and Sanitation Support Organization (WSSO) for implementation of the programme. In the State, the programme is implemented by the Public Health Engineering Department.

2) Audit objectives and criteria

The objectives of the performance audit were to ascertain whether-

- Planning process was efficient;
- Financial management was efficient;
- Implementation of schemes was efficient, effective and economical; and
- Monitoring mechanism and internal control system was in place and was effective.

The implementation of programme in the State was evaluated against the following audit criteria:

- Guidelines for implementation of the programme;
- Manuals on sustainability, water quality and surveillance besides operation and Maintenance;
- Handbook on water treatment technologies;
- National water policy 2002;
- J&K Financial code and Book of Financial powers;
- Project Reports and project/ Action plans for rural water supply schemes.

3) Audit findings

- As against target of covering 5,045 habitations, only 2,992 habitations (59 %) were covered during the period 2009-13. Besides, 1,003 habitations which had already 100 % coverage were again covered during the said period.
- Out of 2,107 water supply schemes (including 971 schemes of ARWSP) taken up for execution during the period 2009-13, total of 702 schemes had been completed leaving 1,405 (including 445 schemes of ARWSP) schemes incomplete as of March 2013.
- Against target of testing of 33,470 water samples during the period 2011-13, only 24,648 water samples were tested.
- The programme guidelines provide for provision of drinking water facility to all rural schools by the end of the year 2010-11. Audit

noticed that 6,152 Government-run rural schools (26 %) out of total 23,676 such schools in the State were without drinking water facility as of March 2013.

- The site for construction of borewells was to be selected after carrying out surveys based on hydro-geological set-up and Hydro Geo Morphological (HGM) maps in consultation with Central Ground Water Board (CGWB). Audit noticed that the sites for construction of bore wells in Jammu Division were neither selected in consultation with CGWB nor based on any survey. Instead, the sites for bore wells were identified by the concerned Hon'ble MLAs/ MLCs and Deputy Commissioners etc., with the result that 519 bore holes had been declared unsuccessful after incurring an expenditure of Rs. 2.89 crore during the period 2009-13. Further, 14 tube wells were declared dry prematurely after incurring an expenditure of Rs. 1.47 crore during the period 2009-13. The Executive Engineer, Ground Water Division, Jammu stated that these tube wells were exploratory in nature.

- Audit examination of records showed that 15 schemes which had no direct bearing on the recharge of drinking water sources and were meant for overall management of water resources viz., construction of pump houses/gang hut, procurement of pipes, construction of cut walls, laying and fitting of pipes for additional sources etc., were executed under the 'sustainability component' of the programme.

- As per programme guidelines any recharging structure meant for overall management of water resources and that does not directly recharge drinking water sources were not eligible for funding under 'Sustainability component' of the programme. However, many such schemes were included in the programme.

- Department had not attempted convergence of the programme with other programmes such as carrying out water quality tests under National Rural Health Mission (NRHM) and for execution of the schemes by utilizing the

services of labour under Mahatma Gandhi National Rural Employment Guarantee Scheme.

- The programme guidelines provide for preparation of Village Water Security Plan (VWSP), which has to include the demographic, physical features, water sources, available drinking water infrastructure and other details of the village. The VWSPs of the districts were to be consolidated at the district level and thus would have formed the basis for formulation of District Water Security Plans (DWSPs). Under the DWSP, all in-village work was to be carried out by the Gram Panchayat or its sub-committee i.e. VWSC. Audit noticed that neither any VWSPs were prepared nor any details regarding location, design of all water sources, existing sustainability structures, water yield and pre and post monsoon static water levels etc., essential for framing the schemes been collected. Consequently, DWSPs had not been formulated in any of the districts in the State (March 2013).

- The programme guidelines further provide for preparation of annual Comprehensive Water Security Action Plans (CWSAPs) to include broad directions/ thrust and tangible targets planned to be achieved in the financial year. In order to implement the scheme, the State Government was required to prepare the specific framework and based on this framework, the State level planning for taking up water supply schemes for the 11th Plan Period (2007-12) was to be prepared. Audit observed that no State Sector framework was prepared nor had any five year rolling plans been formulated.

4) Audit recommendations

The Government may consider to:

- ensure implementation of all components of the programme in accordance with the NRDWP guidelines.
- strengthen the monitoring mechanism of all schemes under NRDWP.

http://saiindia.gov.in/english/home/Our_Products/Audit_Report/Government_Wise/state_audit/recent_reports/Gujarat/2012/Report_4/chap_2.pdf

VII. International Audit Report: Canada: Status Report of the Commissioner of the Environment and Sustainable Development to the House of Commons--Protection of Species at Risk (2008)

1) Background and purpose of audit

As of June 2007, there were 389 species in Canada listed as at risk on Schedule 1 of the 2002 Species at Risk Act. Under the Act, the Minister of the Environment and the Minister of Fisheries and Oceans are responsible for preparing recovery strategies, action plans, and management plans for species at risk for which they are the competent minister. In 2001, audit found that there was a need for better baseline information to enable the government to effectively manage species at risk. Audit recommended that Environment Canada, Fisheries and Oceans Canada and Parks Canada develop a comprehensive inventory of species at risk under their jurisdiction and ensure that recovery strategies for these species be developed and implemented. The three organizations agreed with audit recommendations.

Apart from its intrinsic value as part of Canada's natural heritage, Canada's biodiversity, including wild species of plants and animals, represents a vast storehouse of biological resources. The plants, mammals, and aquatic species found in ecosystems are interdependent and therefore maintaining ecological diversity is important to maintaining the health and integrity of the environment. Although it may go unnoticed by most people, the loss of one or two key species can have ripple effects across an ecosystem with potentially significant effects on our quality of life. According to various scientific sources, human activities in the

twenty-first century have greatly increased the rate at which species are disappearing.

2) Audit objective, scope and criteria

Objective

The objective of the follow-up audit was to determine whether Environment Canada, Fisheries and Oceans Canada, and Parks Canada have made satisfactory progress in implementing selected major recommendations from Chapter 1 of the 2001 Report on the Great Lakes and St. Lawrence River Basin. The recommendations concerned the need to develop and implement recovery strategies for species at risk under their jurisdiction.

Scope, and approach

Audit work focused on measures that the three organizations have taken to address selected 2001 recommendations and the results they have achieved. Recommendations were selected based on their significance and interest to Parliament. Since species at risk are being managed as a national program, scope for this follow-up audit is national. Since the 2001 audit, the Species at Risk Act (SARA) was adopted, requiring the three organizations to prepare recovery strategies and action plans for extirpated, endangered, and threatened species and management plans for species of special concern. Consequently, audit considered the relevant sections of the Species at Risk Act. Audit assessed the performance of the federal government and not the performance of other levels of governments. In carrying out the audit, audit interviewed department officials and relevant stakeholders and reviewed and analyzed departmental files, including reports, databases, policies, and action plans.

Criteria

Audit used the following criteria to assess progress the three organizations made in

developing and implementing recovery strategies for species at risk under their jurisdiction based on audit's 2001 recommendations and the Species at Risk Act.

- Developing and maintaining inventories of species at risk under their jurisdiction;
- Preparing recovery strategies and management plans for the listed species at risk for which they are responsible (SARA, sections 37, 39, 41, 42, 65, 66, 68);
- Preparing action plans to implement recovery strategies for species at risk for which they are responsible (SARA, sections 47, 48, 49); and implementing recovery actions.

3) Key findings

Species at risk

- Through various funding agreements with third parties, inventory work for species at risk under Environment Canada's responsibility is being carried out. Although some information is available, officials from the Department could not provide audit with evidence to demonstrate the completeness of the inventory for the 247 species at risk for which the Department must ensure that recovery strategies or management plans are prepared.
- Fisheries and Oceans Canada carries out inventory work related to aquatic species. Audit found that information on some aquatic species at risk exists, the Department did not provide audit with evidence that data on the 79 species at risk under its responsibility were readily available.
- Parks Canada also carries out biodiversity and species at risk inventories in its national protected heritage areas. It has implemented processes to plan and prioritize work, and has created inventory systems, including standards and methodology, to collect, compile, and share data. The Agency has conducted inventories on most lands under its jurisdiction. It has an overall picture of the presence and location of species at risk on the lands it administers and is working toward completing and regularly updating the information. Since 2006, the Agency has made

species at risk inventory information available on its website.

- However, on a national basis, considering progress made by all three organizations, the federal government's progress has been unsatisfactory. There is no comprehensive inventory of species at risk to provide the baseline information needed for the development of science-based recovery strategies and action plans

Recovery strategies and management plans

- Under the Act, as of June 2007, completed recovery strategies were required for 228 species at risk. In total, recovery strategies for 55 species were completed at that date. Parks Canada produced strategies for 54 % of the species it is responsible for, Fisheries and Oceans Canada produced strategies for 32 % and Environment Canada for 12 %.

- Officials from all three organizations have indicated that the cooperation and consultation process often delays the completion of recovery strategies.

- As previously mentioned, of the 228 species at risk for which recovery strategies were required as of June 2007, recovery strategies were in place for 55. Audit expected that when developing recovery strategies, organizations would have identified critical habitat to the extent possible, as required by the Act. However, critical habitat was identified for 4 of the 55 species for which a recovery strategy was completed. Critical habitat has been partially identified for another 12 species.

- Although many recovery strategies have not been completed, organizations were carrying out recovery activities. Many of these activities were initiated before the Act came into force and are being carried forward. They range from research, public awareness, and education, to control of human activities, protection of habitat, and reintroduction of species.

- Environment Canada does not have a systematic approach to planning and implementing recovery activities. Although the

Department has been focusing its implementation activities on migratory birds, it has also initiated recovery activities for other species, such as the boreal felt lichen.

Source:

http://www.oag-bvg.gc.ca/internet/English/admin_e_41.html