Ministry of Environment

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- The power ministry has decided that the enforcement of the standards would be postponed by another two years — from 2015 to 2017, that would lead to lost savings of hundreds of millions of dollars in oil imports.
- The standard called Corporate Average Fuel Economy (CAFE) will ask auto manufacturers to raise fuel efficiency of cars by about 18%, up from the average of 14.1 km/litre of petrol to 17.3. With it, cars will have one to five star labels depending on their fuel efficiency.
- The CAFE standard is the average annual fuel efficiency for a manufacturer fleet and is measured in terms of global warming causing carbon dioxide emissions.
- The standard will ensure fuel efficient and lighter cars and use biofuels and hybrid technologies such as electricity and hydrogen cells.
- The Indian auto-industry had started at a better footing than the car markets in many developed countries on this ground. The sale of smaller cars remained at a relatively higher level than that of SUVs and bigger cars.
- For some years the industry notched an improvement in the efficiency of the engines even as the average car weight of the fleet sold continued to increase but in the past couple of years this has changed. The sales of heavier vehicles have begun to increase and the average fuel efficiency of the fleet on road has dipped.

ANALYSIS

- India cannot afford to delay its own programme on the wrong premise that it will affect the growth of the automotive industry. If anything, vehicle manufacturers should welcome the Power Ministry's notification on fuel efficiency norms and its 2017 deadline — already pushed back from 2015 — for compliance, as it enables long-term planning.
- The sharp growth in demand for petrol and diesel, and the rising burden of oil imports make that a priority. Countries with major manufacturing capacities are working to achieve higher average efficiency in their vehicles, with the twin goals of conserving fuel and reducing the emission of carbon dioxide, a greenhouse gas.
- As the Global Fuel Economy Initiative of the U.N. Environment Programme points out, a major manufacturing country can afford to set clear standards in advance to facilitate suitable long term investments by industry.
- So it is wrong to argue for an even longer delay in standard-setting on the ground that the industry is experiencing sluggish growth.
- As it embarks on the efficiency quest, India should actually look for a leapfrog effect to ensure that only the most efficient vehicles are produced and sold.
- To address the 'rebound effect' — people driving more because cars give better mileage — it must incentivise alternative modes such as inter-city rail services and urban public transport.
- Also important is to achieve clarity of planning — the responsibility of achieving fuel efficiency should squarely lie with a single Ministry. That would avoid the kind of wrangling witnessed between the Ministries

NGT ON SAND MINING

- The National Green Tribunal (NGT) ordered a nationwide stay on sand mining on river beds without Environment Ministry clearance.
- The interim order came on a petition filed by the NGT Bar Association as a reaction to the suspension of IAS officer Durga Shakti Nagpal, who had been overseeing a drive against illegal sand mining in Gautam Budh Nagar district in Uttar Pradesh.
- At the same time, the Ministry has decided to approach the Supreme Court to seek clarification on the process for according environmental clearances for minor mineral mining projects occupying less than five hectares, as well as send an inspection team to U.P. to look into illegal sand mining there.
- On February 27, 2013, the supreme court ordered mandatory environmental clearance from the Environment and Forests Ministry for excavation of all minor minerals.
- The recent NGT decision does not go beyond the pronouncement of the Supreme Court orders but only pushes implementation of the orders.
- The court order was opposed by many State governments with the construction industry lobbying hard against it.
- This led to the Prime Minister's Office intervening for brick kiln owners and the Cabinet Committee on Infrastructure also debating the issue.
- The Environment Ministry, is likely to plead before the court to let State authorities give environmental clearance for less than 5-hectare plots.
- The Ministry believes that instead of it itself dealing with thousands of clearances for small projects, it would be wiser to let the States handle them under strict guidelines laid down by the Centre.
- The Ministry will also ask for a stipulation that miners should not seek clearances for a cluster of less than 5-hectare plots as that will add up to a large area.

CRITICISM

- The ministry of environment and forests created a panel to investigate sand mining along the Yamuna in Uttar Pradesh, which found evidence of rampant illegality and recommended more compliance hoops to jump through. The National Green Tribunal took up the matter and banned all sand mining in riverbeds, even on small patches, without permission from the MoEF or state environment impact assessment authorities.
- With the construction sector booming in the country, the demand for sand has grown consistently over the past decade. Instead of balancing the legitimate needs of the economy and the environment, and seeking effective local monitoring of mining activity, the dominant impulse has been to tighten the grip on approvals.
- Removing certain amounts of sand and boulders prevents riverbed aggradation, which can worsen the impact of floods — but the zealous green tribunal has ignored that logic. This is action replay of the Supreme Court's disastrous decision in February 2012 to freeze all mining without elaborate permissions, including minor minerals like earth, sand, gravel and other stones.
- Apart from the small businesses shut down and livelihoods lost, effects of that ban cascaded across the economy, as the price of construction raw material shot up. Material that was in plentiful supply now began to be hoarded, distorting the market further.
- While illegal sand mining must be tackled, making regulation cumbersome and centralised will only deter legal mining, an activity that underpins construction and has a direct impact on infrastructure creation and growth.
- Withholding leases beyond a point for a necessary economic activity, only encourages illegal mining. Many politicians and officials profit from this gap between demand and supply, and the courts have given greater weight to this counterproductive approach.
- This only encourages more indiscriminate and environmentally unsafe mining practices, through furtive arrangements between local people, middlemen and businesses.

Panchayat Biodiversity Registers (PBR)

- It have details of biological resources and native wisdom of the region.
- Biodiversity registers are meant to help in sustainable use and conservation besides being an authentic reference document for researchers and students of schools and colleges.
- The PBR is not a catalogue of information, it is a legal document that can be presented in a court of law.
- It can be used as a proof to deal with misappropriation and benefit sharing.

Why is it in news:

- In the past, a range of institutions and agencies had been developing PBRs in their own format and style resulting in no uniformity, clarity or authenticity. The National Biodiversity Authority (NBA), set up under Biological Diversity Act, is coming up with elaborate guidelines on access to Panchayat Biodiversity Registers (PBRs).

Green Toilets

- All trains maintained by the Delhi Division will have green toilets.
- Open discharge toilets on trains have been under constant criticism because of creating the problem of manual scavenging which led to a series of trials with green toilets on train.
- The new toilets will have a collection tank fitted with anaerobic bacteria to decompose faecal matter completely and only a colourless, odourless benign liquid that does not pollute the environment will be released.

Bio-Digester

- A biodigester is an anaerobic tank (oxygen-free), which digests organic material biologically.
- It is used to treat black water (human waste) on site, eliminating pathogens and malignant bacteria, so the treated water can be used for irrigation.

Benefits of using a Biodigester:

- It digests organic solids in an ecological way;
- It prevents human waste and untreated water from contaminating groundwater;
- It offers an alternative to dumping sewage into rivers, lakes and fields in rural and semi-rural areas where there are no city sewage systems;
- The effluent of water can be used as fertilizer for soil, to water plants, or for fish ponds;
- It's cleaner, more effective and easier to use than a septic tank because it doesn't need to be cleaned or emptied and doesn't create leakage problems;
- It is odorless, as opposed to composting toilets and septic tanks;

Project SOS

- The Nature Forever Society (NFS) has decided to launch Project **Save Our Sparrows(SOS)** by distributing 52,000 bird feeders to interested citizens, institutions and organisations across the country.
- It as a unique functional conservation programme involving common people.

Biodiversity

International Framework

1. Genetic diversity vs genetic variability: Genetic diversity refers to the amount of genetic variations in a species. It is distinguished from genetic variability which describes the tendency of genetic characteristics to vary. Genetic diversity serves as a way for populations to adapt to changing environments. With more variation, it is more likely that some individuals in a population will possess variations that are suited for the environment. When humans initially started farming, they used selective breeding to pass on desirable traits of the crops while omitting the undesirable ones which leads to monocultures with no genetic diversity making crops extremely susceptible to

widespread disease. Among oceanic plankton, viruses aid in the genetic shifting process. Ocean viruses, which infect the plankton, carry genes of other organisms in addition to their own. When a virus containing the genes of one cell infects another, the genetic makeup of the latter changes.

2. Genetic pollution: It is uncontrolled hybridization and genetic swamping and threatens specially the endemic species. Genetic pollution leads to homogenization or replacement of local genomes as a result of either a numerical and/or fitness advantage of an introduced species. These phenomena can be especially detrimental to rare species that come into contact with more abundant ones. The abundant species can interbreed with the rare species, swamping its gene pool.
3. Genetic Use Restriction Technology (GURT): It prevents seeds from germinating in the next growing season unless treated chemically by the seed company prior to planting. When seeds of crop varieties (containing this kind of genetic manipulation) are purchased from the company and planted, they germinate and grow normally but produce seeds that do not germinate when saved by the farmers for sowing during the following season.

IUCN Red List

Species are classified on the basis of rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation.

1. Extinct (EX) - No individuals remaining.
2. Extinct in the Wild (EW) - Known only to survive in captivity, or as a naturalized population outside its historic range.
3. Critically Endangered (CR) or Possibly Extinct - Extremely high risk of extinction in the wild.
4. Endangered (EN) - High risk of extinction in the wild.
5. Vulnerable (VU) - High risk of endangerment in the wild.
6. Near Threatened (NT) - Likely to become endangered in the near future.
7. Least Concern (LC) - Lowest risk.

Biodiversity Hotspot

1. (a) It must contain ≥ 0.5% or 1500 species as endemic and (b) It must have lost at least 70% of its primary vegetation.
2. India's 2 hotspots are W Ghats and E Ghats. #rd one is in NE jointly shared with Myanmar.

Andaman and Nicobar and Lakshwadeep Islands have been named as the new "hope spots" by the International Union for Conservation of Nature (IUCN) and oceanographer Sylvia Earle of Mission Blue, an organisation involved in the study of oceans.

A hope spot is an area of ocean that merits special protection because of its wildlife and significant underwater habitats. The two islands are the first spots in India and part of 31 new hope spots across the world added to the existing 19 spots.Andamans and Nicobar islands have been declared a hope spot as it has some of world's unique species of birds and plants. In the case of Lakshadweep, the coral reefs are quite sensitive to the ocean environment and that needs protection.

Genetic Colonialism

1. It refers to attempt by MNCs to use biopiracy and usurp the traditional knowledge and

practices of local people. These MNCs then present the product as an invention by them and get patents and deprive the locals of their right to use such products.

India & Biodiversity

ESZs

1. Proposals for declaring ESZs have been shot down on grounds of impeding development. Further, ESZ guidelines so far have had a focus around protected areas. It should also include other fragile areas.
2. In 2002, the National Board for Wildlife discussed the concept of the ESZ, the idea being to create a "shock absorber" or a "zone of transition" around national parks, sanctuaries and protected areas. States were free to declare such areas in other places as well.
3. Construed by several States as a no go for development, they did not come forward to declare an ESZ around all their protected areas.
4. In 2006, the Supreme Court reminded the States to declare these zones, saying that non-compliance would have the Court stepping in to enforce a default 10 kilometre ESZ around protected areas.
5. Still met with a silence, MoEF issued guidelines in 2011. But since then the ESZs so notified focused mostly around major polluting sources and extractive industries to be kept out from the protected sanctuaries. Very few notifications tackle deal with places which are not protected areas but are ecologically sensitive.

1. India has only 2.4% of world land area and 4% of fresh water, yet accounts for 7.3% of recorded species making it 3rd most mega-diverse country (after Brazil and Costa Rica). Plant species: 45K, animal species: 91K. India's highest concentration of species is in Agasthymalai Hills in W Ghats.

Sanctuary, National Parks, Conservation Reserves & Community Reserves

1. Conservation reserves & community reserves: They act as buffer zones or connectors between established national parks, wildlife sanctuaries and reserved and protected forests of India. Such areas are designated as conservation areas if they are uninhabited and completely owned by the Government of India but used for subsistence by communities, and community areas if part of the lands are privately owned. Administration of such areas is through local people. Community reserves allow communally owned for-profit wildlife resorts. These categories were added because of sometimes large areas around national parks were left unprotected.
2. Sanctuaries & national parks: While in sanctuaries some rights of local population are recognized, in national parks, no such rights are recognized. Removal of any forest produce from national parks requires the approval of national board for wildlife protection while it is allowed in a regulated way in sanctuaries. A sanctuary can be converted into a national park on the recommendation of state wildlife board which is then approved by the national wildlife board and finally MoE and the notification is released. Thus a

sanctuary is at the state level whereas a national park is at the national level.

Biosphere Reserves

1. Core zone: This is the central area and has to be kept undisturbed of all activities except research activities (which don't disturb wildlife).
2. Buffer zone: Only some light activities like tourism, fishing, grazing etc. are allowed which don't disturb the core zone. Research activities are encouraged here.
3. Transition zone: Outmost part and not delimited. Activities have to be harmonious with the biosphere reserve.

Sacred Groves of India

1. They are communally + NGO protected forests which usually have a significant religious connotation for the protecting community. Hunting and logging are usually strictly prohibited but other forms of forest usage like honey collection and deadwood collection are sometimes allowed on a sustainable basis.
2. Sacred groves did not enjoy protection via federal legislation in India until the introduction of the protected area category community reserves under the Wildlife (Protection) Amendment Act of 2002.
3. Myristica swamps: THey are the sacred grove in Kerala which are one of the densest groves. They are typically found in valleys making them prone to inundation. But they are being converted into paddy fields. Their water holding capacity is immense and thus their depletion can lead to floods in rains and dry valley in other seasons.

Western Ghats (Gadgil Panel)

Ecologically Sensitive Zones or Ecologically Sensitive Areas

1. Current system: Currently ecologically sensitive zones owe their existence to initiatives of civil societies or a resolution of Indian Board for Wildlife in 2002 to protect areas up to 10 km from the boundaries of wildlife sanctuaries and national parks. Human activities are restricted here. The activities are classified into 3 types: (a) Prohibited: which include mining, industries, use of hazardous substances etc. (b) Regulated: which include tourism, felling of trees etc. (c) Permitted: which include ongoing agriculture by local communities, rainwater harvesting etc.
2. Mandate: It had a mandate to demarcate areas within the Western Ghats Region which need to be notified as ecologically sensitive, and make recommendations for conservation, protection and rejuvenation of the Western Ghats following consultations involving people and State governments. It was also required to recommend the modalities for the establishment of the Western Ghats Ecology Authority (WGEA) under the Environment (Protection) Act, 1986 (EPA).
3. Panel recommendations: The panel recommended large parts of the Ghats to be declared ecologically sensitive zones. The zonation will be 3 tiered - ESZ 1 or highest sensitivity, ESZ 2 and ESZ 3. In ESZ1 all mining has to stop by 2016. In ESZ2 and 3 no new mining can be allowed. Even this mining has to be subject to extensive regulations. Total area of W Ghats under ESZ1 and ESZ2 is 75% and under ESZ1 alone is 60%. After looking at available research and meeting a cross-section of people in over a dozen sites, the WGEEP concluded that the entire Western Ghats are an ecologically sensitive area. However, within this overall category, it has defined three types of Ecologically Sensitive Zones (ESZs). In all three zones, it has recommended that there should be no SEZs, no

new hill stations, no inter-basin linking of rivers and that dams which have outlived their utility should be decommissioned. In ESZ 1, the highest sensitive zone, it suggests no new mines, existing ones to be phased out by 2016, no new polluting industries, existing ones to be converted to zero pollution, no large storage dams or thermal power plants and no new railway lines or national highways. New mines will also not be permitted in ESZ 2 but existing ones can operate under strict conditions. In addition, no new polluting industries, existing ones to be made zero pollution, no new large storage dams but existing thermal plants can continue if they eliminate pollution. And in ESZ 3, new mines, new industries and thermal power plants will be permitted under strict conditions and a social audit.

Proposed Administrative Architecture

1. Central and state level: It wants to create Western Ghats Ecology Authority as a statutory authority appointed by MoEF with powers under the EPA, 1986. The body will have ecologists, scientists, civil society representatives, tribal groups, officials, planning commission (because western ghat development plan is funded by the FYP), national biodiversity authority, central pollution control board and state government members and would administer the ESZs. Correspondingly each state will have a state WGEA which will interact closely with state planning departments, state biodiversity boards and state pollution boards and will work with the WGEA.
2. District level: Currently each ESA (ecologically sensitive area) is administered by a high level monitoring committee appointed only by MoEF which doesn't have any regulatory powers, financial resources pr human resources. In many ESZs no committee existed for many years. The panel recommends it to be replaced by District Ecology Committees which should work in collaboration with zila parishad as well as district planning committee. It should have authority over location of industry, land use, storage dams etc.
3. It has also recommended “adaptive co-management” where decisions are taken after full consultation and involvement of the local gram sabhas. A good example of how localised authorities can be effective is the Dahanu Taluka Ecology Authority in Maharashtra, set up on directions of the Supreme Court, which has succeeded in protecting the eco-sensitive nature of that area despite its proximity to Mumbai and pressure from strong political and business interests.

Implications of Heritage Site Recognition

1. India will have to inform the World Heritage Committee (WHC) of any proposed infrastructure development, major construction etc. before an irreversible decision has been taken. Moreover any such permission from the Indian authorities should be granted only after through EIA.
2. India will also have to ensure proactive sustainable tourism in the areas.

Environment Performance Index

1. Every state will be rated on environment performance to check the illegal mining, coastal abuse and environment degradation. It would be implemented by 2013 and will be used in allocating grants.

Social Forestry

1. It means raising fast growing trees near the habited areas so as to serve the needs of the

local population (timber, fodder etc.) and thus relieve pressure on the forests.
2. Initially the selection of trees was done by the government and had no local inputs. So eucalyptus were planted and it failed to relieve pressure on the forests. But subsequently the planning, execution and monitoring was handed over to village panchayats.
3. It can include farm forestry (individual farmers planting trees in their fields to meet domestic family needs), agro forestry (trees being planted at field boundaries) and area extension forestry (trees being planted on road sides, canals etc).

Government Norms

Environmental Violation

1. Serious: A violation of this type will immediately lead to the closure of the unit. Example is non treatment of nuclear waste from a nuclear plant.
2. Not so Serious: The violating unit may get up to 3 warnings to correct its practices. Example is non treatment of non nuclear waste from a nuclear plant, pollution of nearby water resources by an industry.

Bharat Stage Emission Norms

1. Bharat 3: Since 2010, Bharat stage III norms have been enforced across the country.
2. Bharat 4: In 13 major cities, Bharat stage IV emission norms are in place since 2010.
3. Bharat norms vs Euro norms: The Bharat Stage norms have been styled to suit specific needs and demands of Indian conditions. Euro-III is tested at sub-zero temperatures in European countries. In India, where the average annual temperature ranges between 24 and 28 degree Celsius, the test is done away with. Another major distinction is in the maximum speed at which the vehicle is tested. A speed of 90 km/h is stipulated for BS-III, whereas it is 120 km/h for Euro-III, keeping emission limits the same in both cases.

Catalytic Converter

1. It was made mandatory for petrol vehicles in 1995 and unleaded petrol was introduced.
2. It is an exhaust emission control device which converts toxic chemicals into less toxic. It has a catalyst which oxidizes CO and unburned hydrocarbons (HC) and reduces NO_x to CO_2, N_2 and H_2O. 2 way catalytic converters used to treat only HC and CO.
3. If the concentration of HC is abnormally high (as in partially burnt fuel), it may lead to high temperatures and meltdown of the converter.
4. Catalyst poisoning occurs when the catalytic converter is exposed to exhaust containing substances that coat the working surfaces so that it cannot contact and treat the exhaust. The most-notable contaminant is lead, so vehicles equipped with catalytic converters can be run only on unleaded fuels. Other contaminants are S, Mn, P.

Shipping Emissions

1. The sulphur content in fuel of ships has to be reduced to 3.5% from 4.5%. In the Emission Control Area (ECA), it has to be reduced to 1% from 1.5%.

Forest Classification

1. Very dense forest: Tree canopy density of ≥ 70%. It covers 2.5% of total area.
2. Moderately dense forest: 40% ≤ Tree canopy density < 70%. It covers 9.75% of total area.
3. Open forest: 10%≤ Tree canopy density < 40%. It covers 8.75% of total area.

Largest forest cover is in MP followed by Arunachal Pradesh.

Biochemical Oxygen Demand

1. This is the amount of O2 needed by the aerobic micro-organisms in a sample of water to break down the organic compounds present in it @ 20º C over 5 days. The limit in India is 3 mg per liter.
2. There are aquatic micro-organisms which break down the organic compounds in the water into energy for reproduction and food. The higher the number of compounds, the higher the microbial activity and higher their reproduction. The higher the number, the higher their demand for dissolved O2 in water which if exceeds the rate of dissolution of O2 from air into water can lead to depletion of dissolved O2 in water and death of fishes etc.

Land Use Classification

1. It divides land form class 1 to class 8.
2. Classes 1 to 4 are cultivable with 4 being suitable for only subsistence agriculture (water-logged soils commercially unusable) and class 3 suffering from erosion etc.
3. Class 5 is suited for moderate grazing while class 6 for limited grazing.
4. Class 7 is suited only for forestry and class 8 for wild life.

Coastal Regulation Zone

1. CRZ-I: Areas that are ecologically sensitive and important, such as national parks/marine parks, mangroves, coral reefs, areas close to breeding and spawning grounds, areas likely to be inundated global warming and area between low tide line (low neap tide) and the high tide line (high spring tide). No new construction shall be permitted except atomic energy projects and pipelines.
2. CRZ-II: The areas that have already been developed on the shore. Construction and new activities shall be permitted only on the landward side.
3. CRZ-III: Areas that are relatively undisturbed and those which do not belong to either Category-I or II. No construction is possible up to 200 m of high tide line. Between 200-500 m construction is possible only subject to local traditional rights (for residential units) and government approval (for commercial enterprises).
4. CRZ-IV: Coastal stretches in the Andaman & Nicobar, Lakshadweep and small islands, except those designated as CRZ-I, CRZ-II or CRZ-III. All activities are to be regulated by government.

Air Pollutants Limits

1. RSPM: 100 µg/m3.
2. CO: 80 µg/m3.
3. SO_2: 80 µg/m3.
4. O_3: 80 µg/m3.

Government Initiatives

Solar Cities

1. The Solar City programme aims to address the energy problem of the urban areas in a holistic manner. The various initiatives like promoting solar water heating systems;

deploying solar cells; designing solar buildings and promoting urban and industrial biomass to energy projects would be consolidated under the programme.
2. The programme aims at minimum 10% reduction in projected demand of conventional energy and increasing energy production through renewable energy.
3. It will motivate the local Governments for encouraging and adopting renewable energy technologies and energy efficiency measures. A total of 60 cities/towns were identified to be supported for development as Solar Cities during the 11th Plan period.

Environment (Protection) Act, 1986

1. It empowers the government to frame rules regarding regulating pollution, setting norms, industries etc.
2. It creates procedures and safeguards for accidents which may cause environmental pollution and handling hazardous substances.

National Environment Appraisal and Monitoring Authority (NEAMA), 2011

1. This authority will appraise and monitor the compliance of various projects. It will be a fully professional, science-based and autonomous body. The Ministry of Environment will continue approval of the projects based on NEAMA's appraisal.
2. This marks a major improvement over the current system as it separates the appraisal and approval parts.

Wildlife Habitat Guidelines (Revised), 2011

1. Critical Wildlife Habitats (CWH) are areas which are absolutely essential for survival of endangered species and hence should be left unviolated. But declaring areas as CWH conflicts with the interests of the tribals as it displaces them.
2. In the previous guidelines, the decision to declare the area as CWH rested with the forest officials with token participation of other stake holders. In the new guidelines, a committee of gram sabha members, forest officials, tribal NGOs and scientists will together take the decision. For any relocation to be carried out, the free and informed consent of the gram sabha is necessary.

National Afforestation Programme

1. Its objective is to improve the forests with community participation and specially benefit people living on the forest-rural fringe.
2. It devolves the forest management and protection responsibilities to decentralized institutions of Joint Forest Management Committee at village level and Forest Development Authority at the forest division level. The JFMCs consist of women, SC/STs etc. and the FDA is an aggregate of JFMC. Funds are dispatched directly at FDA and JFMC level. Training etc. are also organized for their members.
3. Apart from afforestation activities, emphasis is also on soil and moisture conservation techniques, fencing, monitoring etc.

National Bamboo Mission

1. Launched in 2006-07, a central assistance of Rs. 8000/- per hectare is provided in order to harness the potential of bamboo crop for enhancing income of the farmers.

2. Its aim is to increase yield from 3 tonnes to 20 tonnes per hectare.
3. Components of the scheme include mass production of quality planting material, improved post harvest management, development of human resources and marketing facilities.

Pollution in Leather Industry

1. Leather industry in India has become 0 discharge industry as ~80% of the effluents are treated and recycled back into use and remaining 20% are solidified and their salts used for other purposes. As a result, Indian leather industry is REACH compliant (EU norms) and exported $4.5 bio in 2011-12 and the target is $14 bio by 2015-16 (growth rate of 20% p.a.).
2. In 11th FYP, government provided 75% assistance (60% centre + 15% states) for setting up effluent treatment plants.

National Action Plan on Climate Change

National Solar Mission

1. To increase the share of solar energy in India's total energy pie significantly by creating 20 GW capacity by 2020.
2. To use refractor types technology to setup MW scale solar plants.

(a) Monocrystalline Silicon Technology

1. A single crystal of silicon is prepared and the wafer cut out of that. It has high efficiency (17%) as the entire lattice is continuous with no grain boundaries (and hence less resistance) but higher costs since a single crystal is expensive to generate and there is a lot of wastage.

(b) Multicrystalline / Polycrystalline Silicon Technology

1. Here there is no need to cut the wafer entirely out of single crystal. A wafer can have multiple crystals. This lowers the costs but also lowers the efficiency (to 10%).

(c) Thin Film Technology

1. They are cheaper to manufacture as they use very less material. A thin film of silicon material is printed between two sheets of other material. But they are less durable.

(d) Concentrated Photovoltaic / CPV Technology

1. It uses mirros and lenses to concentrate sun light and improve efficiency (40%). But challenges are they don't work in diffused light and need direct sunlight.

(e) Graphene Solar Cells

1. They can be cheaper but have very low efficiencies (3% proven). Recent researches have been able to increase the efficiency up to 8.5% by treating them with a chemical.
2. When graphene and silicon are put together they form a Schottky junction which helps in conducting electrons.

National Mission for Enhanced Energy Efficiency

1. The objective was to save 10 GW by 2012 and 19 GW by 2015 (~100 MT CO2 reduction). It has achieved it through star labeling. Star labeling is an energy efficiency rating scheme in electrical appliances and buildings. Scale is 1 to 5 stars with more stars meaning more efficiency. The idea was to develop standards and to make consumers aware while making the purchasing decision. But it remains voluntary.
2. Perform, Achieve, Trade scheme: To induce market based energy savings. All institutions will be given a emissions savings target. Ones achieving more savings will get carbon credits which can be sold to the non performers or else penalties. It is mandatory for all large industrial units. During the first cycle of PAT scheme i.e. from 2012-13 to 2014-15, eight energy intensive sectors such as thermal power, iron & steel, cement, fertilizer, aluminum, textile, pulp & paper, chemicals have been included. 685 accounts in these sector account for about 165 million tonnes oil equivalent of energy consumption annually (~35% of India's energy consumption). Savings will be 6.6 MToE by 2015. The penalty will be a fixed amount (only Rs. 10 lac) + target savings unachieved * cost of 1 tonne of oil equivalent (thus little incentive to cut cost)!
3. Green technologies: Fiscal support, innovation, easier financing for green technologies.
4. Coal plants: This includes encouraging super critical thermal plants (60% of coal plants in 12th FYP and 100% in 13th FYP will be super critical), shifting of freight from road to railways and Integrated Gasification Combined Cycle (converting coal into gas and removing impurities).
5. Residential lighting: The penetration of CFLs in the domestic sector has been relatively limited because of the high costs. The Bachat Lamp Yojana (BLY) provides CFLs to households at the cost of incandescent bulbs. Discoms select qualified investors to sell high quality CFLs in their region. The investors earn carbon credits due to the lower energy use by the CFLs.
6. Energy efficiency in agricultural pumping: Replacement of inefficient agricultural pumps by efficient pumps is enabled through the performance contracting mode. Pumps are evaluated for their current energy consumption, and then the existing pumps are replaced with efficient pumps. The resultant energy savings are evaluated, and the replacer is paid a share .
7. Development in technology for Carbon Capture and Storage (CCS) need to be carefully monitored to assess the suitability and cost effectiveness of this technology for Indian conditions. A major effort must be made to expand energy from clean energy sources. The share of new renewable energy in total commercial energy use at this juncture is around 10.0 per cent with conventional hydro-electricity accounting for another 20 per cent. The share of new and renewable energy could go up to 15.0 per cent by 2020.

National Mission on Sustainable Habitat

1. The objective is sustainable urban development. It will be accomplished through: (a) Promoting the Energy Conservation Building Code. (b) Encouraging shift to public transport. (c) Better urban waste management by higher recycling and to invest in R&D thereof.

National Water Mission

1. To increase water use efficiency by 20%.
2. To meet the urban needs mostly through recycled water and coastal needs through low temperature desalination of ocean water.

National Mission for Green India

1. To increase the forest cover from 23% to 33%.
2. To increase community participation in afforestation.
3. To setup Compensatory Afforestation Management and Planning Authority (CAMPA) and campa funds.

National Mission for Sustaining Himalayan Ecosystem

1. To share information on Himalayan Ecology with neighbors.
2. To setup monitoring centers for Himalayan ecology.
3. To keep 67% of Himalayan land under forest cover and to include community in it.

National Mission for Sustainable Agriculture

1. To develop climate resistant crop varieties.
2. To develop alternate cropping patterns.
3. To use traditional knowledge along with modern.
4. To make rain fed agriculture more resilient.

National Mission for Strategic Knowledge on Climate Change

1. An open source platform will be maintained and all information would be shared.
2. Increasing research by a Climate Science Research Fund as well as private research.

<u>National Watershed Management Programme</u>
Objectives

1. Developing wastelands/degraded lands, drought-prone and desert areas on watershed basis. A watershed is a unit of 500 ha which drains into a common point.
2. Mitigating the adverse effects of extreme climatic conditions.
3. Restoring ecological balance.
4. Encouraging village community for community action and local traditional knowledge.

Activities

1. It will cover projects like soil treatment, erosion check, afforestation, local embankments etc.
2. It will have greater role of PRIs and village forest committees.

<u>National Lake Conservation Programme</u>

1. Prevention of pollution from point sources which includes water treatment.
2. In situ measures of lake cleaning such as de-silting, de-weeding, bioremediation, aeration, bio-manipulation.
3. Catchment area treatment which may include afforestation, storm water drainage, silt traps etc.
4. Prevention of pollution from non-point sources by providing low cost sanitation.

<u>National Wetland Conservation Programme</u>
Activities

1. Wetlands in India are disappearing @ 2-3% p.a. Major threats are conversion into paddy fields and encroachment by real estate developers. India is a party to Ramsar convention which was based on the 'wise use (sustainable development)' principle. Yet there is no legal framework to conserve wetlands. So a draft framework is being prepared to notify in EPA, 1986.
2. The identification of wetlands is done on the basis of ecological importance, level of endangered species being supported etc. So far 115 wetlands have been so identified.
3. Programmes covered are catchment area management, point source pollution treatment, weed control, inventorization etc.

Role of Wetlands

1. Wetlands aid in water filtration by removing excess nutrients, slowing the water allowing particulates to settle out of the water which can then be absorbed into plant roots. Studies have shown that up to 95% of nitrogen can be removed from passing water through a wetland. Wetlands also let pollutants settle and stick to soil particles, up to 70% of sediments in runoff. Some wetland plants have even been found with accumulations of heavy metals more than 100,000 times that of the surrounding waters concentration.
2. Through wetlands ability to absorb nutrients, they are able to be highly biologically productive. Freshwater wetlands are even comparable to tropical rainforests in plant productivity

National Green Tribunal

Powers

1. It investigates matters related to pollution, diversion of forest land to non-forest use, environmental clearances granted to projects under EIA notification 2006, environment, biological material, traditional knowledge etc. It replaced National Environment Appellate Authority in 2010.
2. It was established under the Art 21 and also under India's commitments under the Rio Summit to provide a forum for judicial and administrative remedies for environmental damage.
3. The Tribunal is not guided by Code of Civil Procedure 1908 but is guided by the principles of natural justice. Also being a dedicated tribunal it is expected to regulate emissions (thus helping in carbon markets) and provide speedy justice.

Composition

1. It contains experts from environment and related sciences + administration + judicial appointees. This lends an expert color to NGT.
2. It has a central bench in Delhi and 4 regional benches @ Bhopal, Chennai, Kolkata, Pune.

Expert Group on Low Carbon Strategies for Inclusive Growth

1. Power: In the power sector, it has suggested action both on supply and demand side. On the supply side, we need to adopt super-critical technologies in coal. Gas being in limited supply, its best use is not in base load power, but in combined heat and power systems in large establishments. We need to invest in renewable technologies, particularly solar, wind, hydel and second generation bio-fuels. On the demand side, we need to accelerate

adoption of super-efficient electrical appliances and pump sets through a combination of market and regulatory mechanisms. We need to modernize our transmission and distribution systems.

2. Transport: On the transport front, we need to increase the share of rail. This is not possible unless we drastically improve the efficiency of rail freight transport, and also make it price competitive by bringing down the levels of cross subsidization between freight and passenger transport. Completion of dedicated rail corridor must be taken up on top priority. We need to improve the fuel efficiency of our vehicles through both market based and regulatory mechanisms.
3. Industry: The Expert Group has identified major sources of industrial emissions and made specific recommendation for sectors like Iron & Steel and Cement, which account for over 60% of industrial emissions. It is important that green-field plants in these sectors adopt best technology; while existing plants, particularly, small and medium ones, modernize.
4. Buildings: India is fortunate that most of our commercial buildings that will be extant in 2030 are yet to be built. We need to both evolve and institutionalize Green Building Codes.
5. Forestry: Up to the Eleventh Plan, our focus was on increasing area under forest and tree cover. Given the scarce land availability, achievement in this front has been limited. However, there is a tremendous scope for increasing the stock and quality of existing forests. 'Green India Mission' is being designed to regenerate at least 4 million hectares of degraded forest; increase density of cover on 2 million hectares of moderately dense forest; and overall, increase the density of forest and tree cover on 10 million hectares of forest lands, waste lands and community lands.