

MANAGEMENT OF HAZARDOUS WASTES: PERCEPTIONS ON COMPLIANCE OF THE SUPREME COURT ORDER, 14.10.2003

(in the matter of Write Petition [C] No. 657 of 1995)

Presentation by

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At

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Introduction

- SC Order, 14.10.2003 accepted grim reality of non-compliance of HW Rules in the country
- Realized adverse effects of indiscriminate dumping of HW in India imported from developed countries
- SC had constituted High Powered Committee with Prof. MGK Menon, FRS, as its Chairman in 1997
- Menon Committee submitted report in Feb, 2002
- Taking Cognizance of Menon Committee report, SC passed order, 14.10.2003 & set up SCMC under Chairmanship of Dr. G. Thyagarajan

Principal issues in WP, 657 / 1995

- Concerned about dumping of HW by industrialized countries in India
- Contraventions of the provisions in Basel Convention
- Lack of implementation of HW Rules in India, in terms of no. of units, quantity & quality of HW
- Infrastructure for management of HW (CHW TSDF)
- Institutional capacity
- Application of LNWT / WM
- Strengthening of borders

ToR of Menon Committee

- Basel Convention implementation
- Handling of HW imported for recycling
- Safeguards in place
- Changes required in HW Rules
- Adequacy of facilities for ESM of HW
- Pre-requisites for authorization

ToR of Menon Committee

- Criteria for designation of areas for locating HW units
- Procedures for grant of authorizations by SPCB
- Mechanism for publication of inventory
- Framework for reducing risks to environment and public health
- Mechanism for safe disposal or re-export of HW lying at Ports in India
- Decontamination of ships before braking

Important Findings of Menon Committee

- Management of indigenously generated HW : Closure of units, WM, changes in statute, SLF, Inventory, public information, rehabilitation, monitoring, etc.
- Import of HW : facilities at custom, MARPOL, obligations, Basel Convention, etc.
- Institutional capacity building
- Amendments required in laws
- Policy issues on HWM and worker's health

Acceptance of Recommendations of Menon Committee

- The SC Accepted recommendations made by the Menon Committee & issued order dated 14.10.2003
- The SC formed 10-member Committee for monitoring of compliance of its order and report quarterly. The Committee called as Supreme Court Monitoring Committee (SCMC), chaired by Dr. G. Thyagarajan
- Committee had two nominees of the SC namely Dr. Claude Alvares and Dr. D.B. Boralkar
- The SCMC submitted its report in November, 2006 and Dr. Claude Alvares and Dr. D.B. Boralkar submitted their report in March, 2007.

Functioning of the SCMC

- 19 meetings across the country with focus on field visits
- Consultation with public and HW generators
- Special meeting with all SPCBs, CPCB and MoEF
- Categorisation of States/UTs (> 100000, 1000-100000, and < 1000)
- Sub Committees of SCMC
- Local Area Environment Committees (LAECs)

Impact of SC Order

- Significant changes on the ground for better. Situation changed from “very grim” to “quite good/happy”
- Change in the approach of enforcement and amendments in regulation in 2003 and there after.
- Increased compliance (almost 95% +)
- Setting up of CHWTs and also CETPs up-gradation
- Removal and safe disposal of HW lying in industrial estates and illegal dumps sites
- Reduction in illegal imports of HW

Impact of SC Order

- Removal and safe disposal of HW lying at Ports, *Polluters Pays Principle*
- Public information and toxic release inventory
- Preparation of guidelines and manuals for management of HW
- Levy of fines and supply of drinking water to affected people
- Action plan for rehabilitation/remediation of contaminated sites
- Institutional capacity building initiated

Part II

The Court's directions in its order dated 14.10.2003, and
their implementation

Directions regarding domestic HW

(i): National Inventory

- National inventory nearly completed
- State level inventories completed by 24 SPCBs and 3 PCCs. Checked by CPCB
- 4 SPCBs reported no HW generating units
- Delhi Pollution Control Committee was yet to submit inventory till March, 2007
- 4.82 Million MT of HW generated in India by 29544 units
- Maharashtra & Gujarat generated 1.4 & 1.4 MMT HW/year respectively.

Directions regarding domestic HW

(i): National Inventory

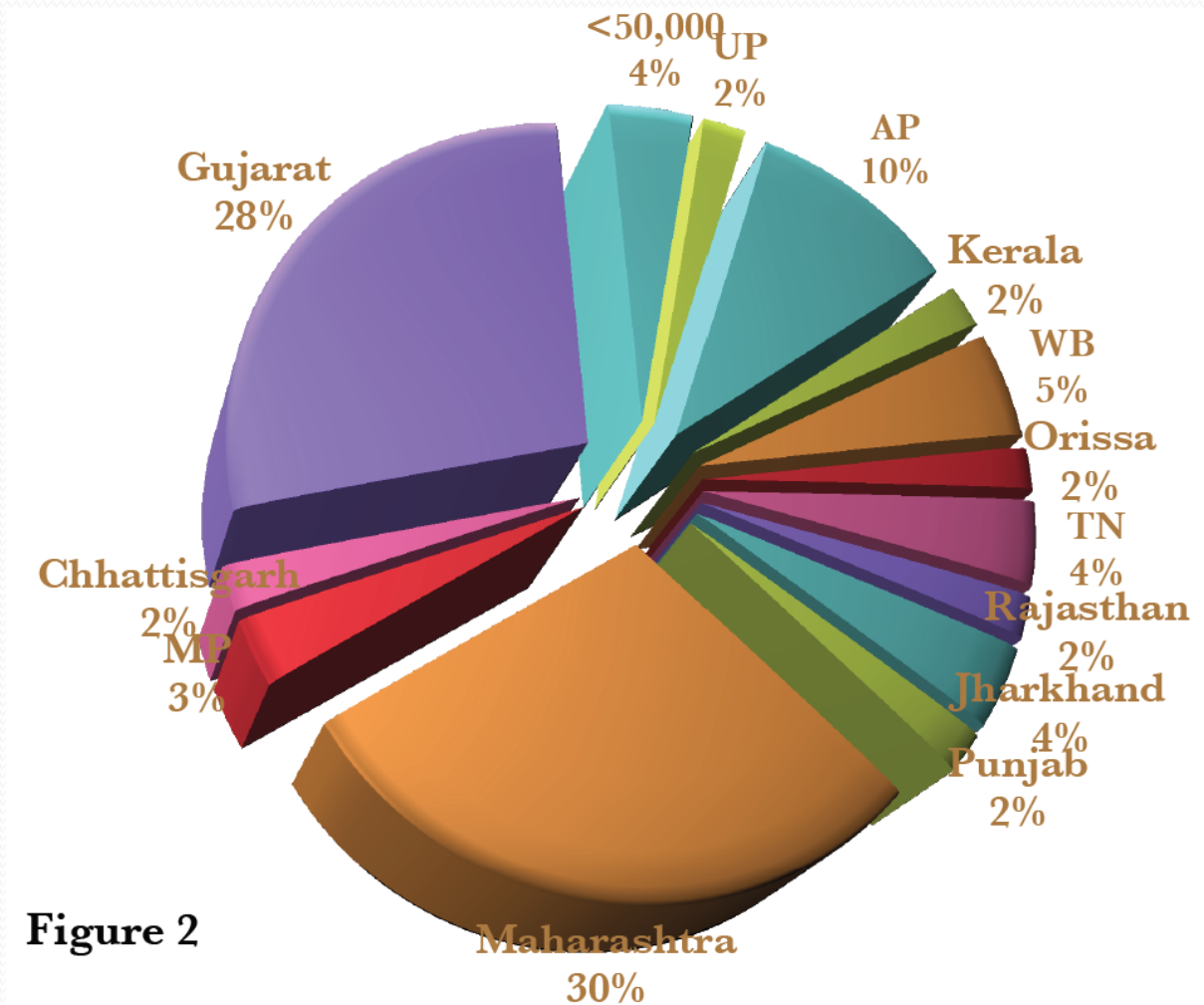


Figure 2

Directions regarding domestic HW

(ii): Display of National Inventories in media/ website

- Maharashtra, Andhra Pradesh and Gujarat maintained information on website
- MPCB developed software for tracking of HW in State
- Many SPCBs either do not have sites or where they do, not maintained or updated

Directions regarding domestic HW

(iii): Display of information by HW generating units on boards at gates & involvement of local community in environment protection (LAEC)

- Successful compliance in major States.
- Apex Court direction is unprecedented and has opened up access to information about potentially hazardous industries for members of surrounding communities
- LAEC : Tarapur, Kerala, Tamilnadu, Delhi, AP

HINDUSTAN INSECTICIDES LIMITED
UDYOGAMANDAL .P.O.

HAZARDOUS CHEMICALS

NAME	QTY/DAY MT	MODE OF STORAGE	DETAILS OF EMERGENCY RESPONSE
CHLORINE	4.75	CYLINDER	
ETHYLE ALCOHOL	1.5	MS TANK	
OLEUM	6.75	MS TANK	
MCB	4.5	MS TANK	
CHLORAL	1.55	LEADLINED TANK	SALVAGING EVACUATION &
CCl ₄	0.45	MS TANK	NEUTRALISING AS
CS ₂	1.65	MS TANK	THE CASE MAY BE.
ETHYLENE DIAMINE	0.6	MS TANK	PLEASE REFER
HCCP	3.6	DRUM/GLTANK	SAFETY MANUAL
BD	1.2	DRUM/GLTANK	
TOLUENE	0.9	MS TANK	
TC	1.6	LEADLINED TANK	
SOLVENT	5	MS TANK	
DDT 50% WDP	8	BAGS	
ENDOSULFAN	5.3	BAGS	
DICOFOL	0.5	DRUMS	
MANCOZEB	3	BAGS	

HAZARDOUS WASTE

HAZARDOUS WASTE STREAM/SOURCE	QTY/DAY (M.T.)	ACCUMULATED QTY. (M.T.)	MODE OF STORAGE/ DISPOSAL
ETP SLUDGE	0.25	100	STORED IN CONCRETE STORAGE YARD
SOLID RESIDUE	0.3	20	IN ROOFED BUNKERS NEAR INCINERATOR AND INCINERATED
OLD DRUM	0.2	50	DECONTAMINATED, CUT INTO SHEETS, SOLD
WASTE OIL	0.050	1	INCINERATED

AUTHORISED No. PCB/HWMA/R2/43/2001 Dt. 23.05.2001.
VALID UPTO 22.05.2006

Directions regarding domestic HW

(iv): CHW TSDF

No.	State	Facility	Capacity Per Annum	Commissioned/under construction
1	Andhra Pradesh	Dindigal	1,50,000	In use since 2001
2	Andhra Pradesh	Parwada	2,00,000	Use commenced (2006)
3	Maharashtra	Taloja	1,20,000	In use since 2002
4	Maharashtra	TTC	10,000	In use since 2004
5	Maharashtra	Butibori	50,000	Ready
6	Maharashtra	Ranjangaon	50,000	Ready
7	Rajasthan	Udaipur	50,000	Commissioned 2006
8	Gujarat	Ahmedabad	70,000	Operational
9	Gujarat	Ahmedabad	40,000	Operational
10	Gujarat	Nandesari	10,000	Operational
11	Gujarat	Bharuch	50,000	Operational
12	Gujarat	Surat	100,000	Operational
13	Gujarat	Vapi	30,000	Operational
14	Gujarat	Bhavnagar	4,500	Operational
15	West Bengal	Haldia	1,80,000	Operational
16	M. Pradesh	Pithampur	70,000	Operational



Directions regarding domestic HW (v): HW incinerators and guidelines

- Guidelines prepared & on display at CPCB website



Table 6: State-wise status of Common HW Incinerators and Captive Incinerators in operation

S No.	Name of the State/UT	Number of Common HW Incinerators	Location Details	Number of captive HW Incinerators	Location Details	Number of HW Incinerators under installation
1.	Andhra Pradesh	2	Dindigal under trial	32	-	Parwada, under construction
2.	Goa	-	-	2	M/s. Syngenta M/s. CIPLA	-
3.	Gujarat	4	Baroda, Bharuch, Surat, Vapi	34		-
4.	Himachal Pradesh	Nil	Nil	1	Morpen Laboratory	Nil
5.	Jharkhand	-	-	1	M/s. Tata Motors	-
6.	Karnataka	2	Anekal Bangalore; Hosakote, Bangalore	12		-

Directions regarding domestic HW

(v): HW incinerators and guidelines

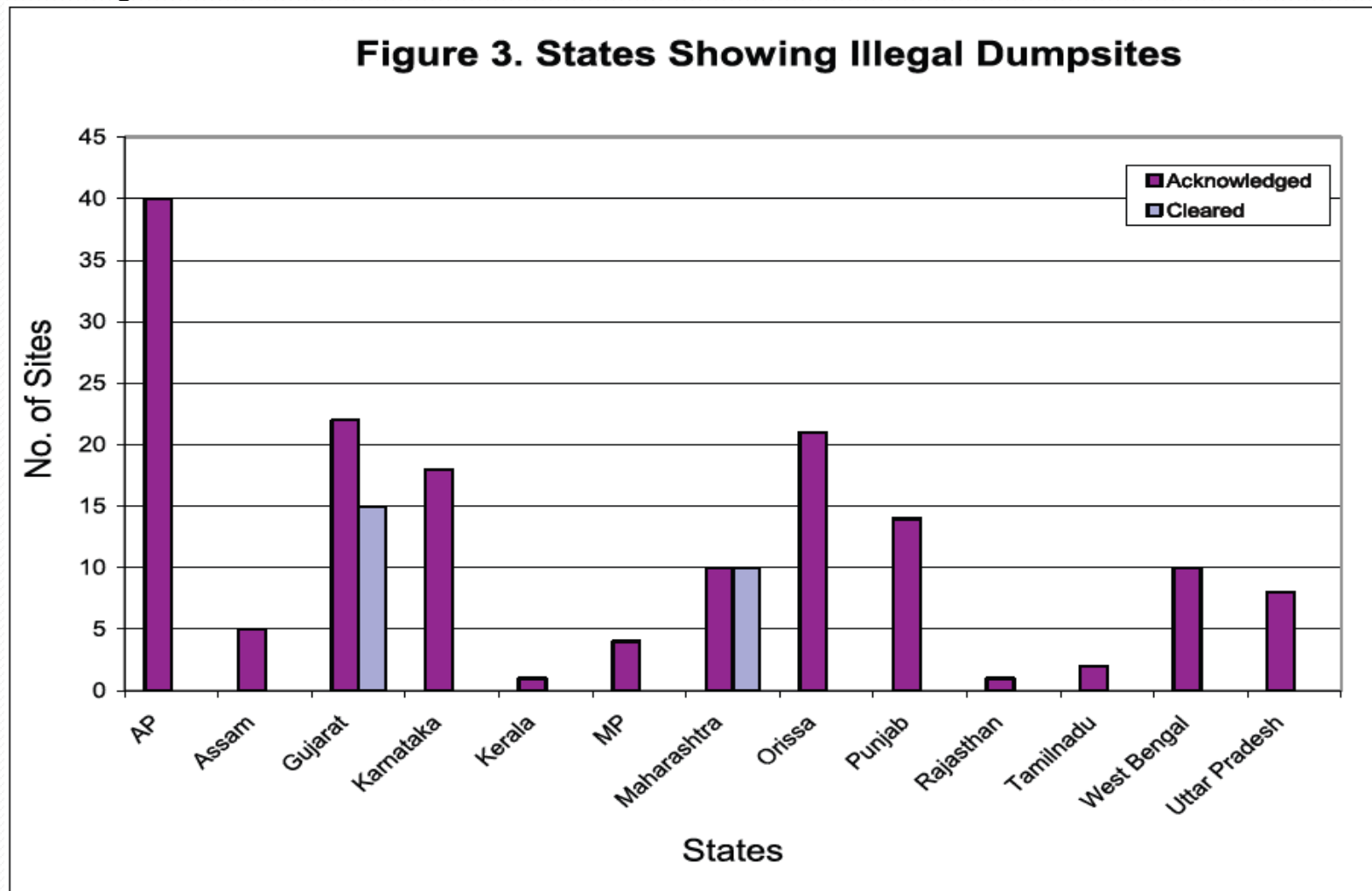
7.	Kerala	-	-	1	HIL, under trial	-
8.	Madhya Pradesh	-	-	12		
9.	Maharashtra	1	CHWTSDF at Taloja	42	-	
10.	Punjab	-	-	15		
11.	Rajasthan	-	-	2	Dholpur, Jaipur	1 proposed at CTSDF
12.	Tamil Nadu	-	-	4		-
13.	Uttar Pradesh	Nil	Nil	11		
14.	West Bengal	-	-	7		
16.	Pondicherry	Nil	-	2		Nil

Note: The above information is as per the information received from the concerned SPCBs/PCCs and from field visits of SCMC members. Some of the captive hazardous waste incinerators, for instance those in AP and TN, have been checked by their respective Boards. However, they cannot meet the CPCB standard guidelines for control of emissions including extremely toxic substances like dioxins and furans from hazardous waste incinerators. Maharashtra Board has issued show cause notices to all 42 captive incinerators.

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites

- The Court was seriously concerned with the several illegal HW dump sites and their impact on health & environment



Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites



Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites

Major Problem HW dumping sites needing special attention

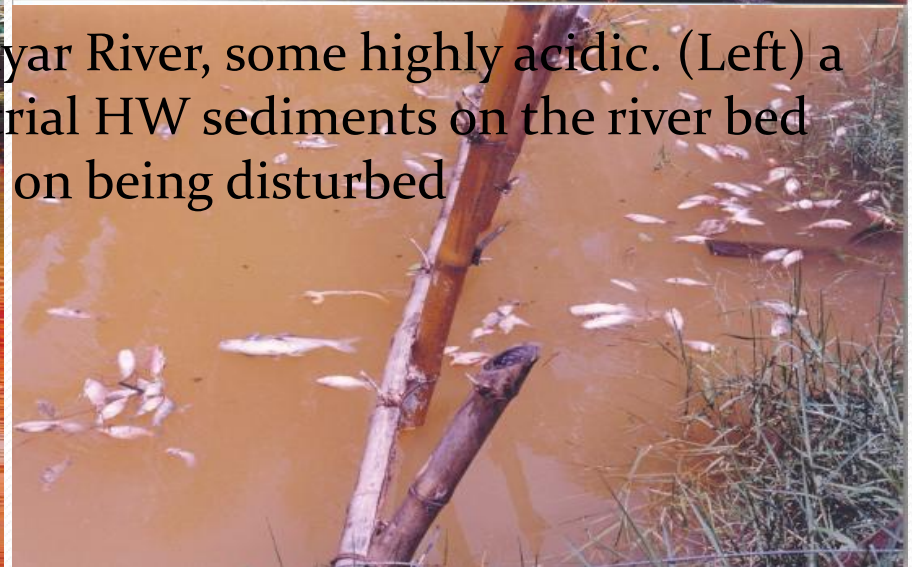
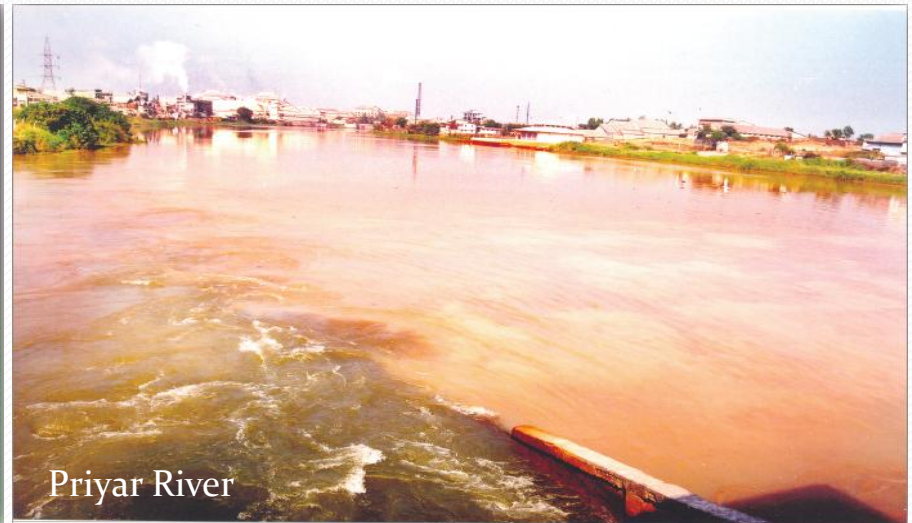


The SCMC was not able to inventorise or get inventorise HW lying abandoned in units that are permanently closed or are under Court receivers in different parts of country

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites

Clean – up of river bed and restoration of life in Periyar river



Fish kill due to toxic effluents in Periyar River, some highly acidic. (Left) a villager demonstrates bluish industrial HW sediments on the river bed which form a cloud on being disturbed

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites

Clean – up of river bed and restoration of life in Periyar river

- SCMC brought entire industrial estate to heel
- Fined Rs. 2.5 Cr to 247 units to set aside money for rehabilitation of the river. SCMC set up LAEC
- Board closed down several industries in coordination with LAEC
- Discovered clandestine discharges at night
- Undiscovered more than 60 illegal outlets
- After a year of these actions pH of the river improved (5-5.5) from a low of 2 (highly acidic)
- Representative of fishing community met SCMC to thank the SC for restoring condition of the river and for bringing the fish back into the water body.
- At the time of filing report, certain actions still remain to be completed (eg – removal of s3ediment from the river bed)

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites

Clean-up and rehabilitation of Katedan lake and other lakes in AP

- Polluting industries discharging HW in lakes were ordered to shut. 60 units ordered to move out of the area
- State Govt. hired consultants for rehabilitation of Katedan lake
- Notice Inviting Tenders issued for construction of STP within one year so as to stop sewage discharge in the lake
- AP Board reported remarkable reversal of the processes affecting the lake due to complete cessation of HW entering water body
- CM of AP insisted that rehabilitation of lakes in and around Hyderabad be covered in two years

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites

Burial of Arsenic waste at Zuari Industries, Goa

- Industry was directed to treat and dispose about 450 MT of Arsenic waste in “hermit storage”. Work is completed at the cost of Rs. 70 lacs.
- Recommended levy of fine of Rs. 10 lacs for not taking timely steps as per SC Order of 14.10.2003
- The “hermit storage” technique of encapsulating the HW was later adopted by SPIC in Tuticorin and others

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites:

Case of HW dumping by Aventis Pharma in Gujarat

- Industry was found discharging HW in agricultural fields. SCMC filed FIR and GPCB ensured closure of the unit.
- Rs.25 lacs BG was taken for remediation. Remediation is completed to satisfaction of GPCB
- This incident had led to the GPCB recalling and reviewing hundreds of such authorisations and tightening the controls over the movement & disposal of HW.



SCMC travelling through Gujarat was horrified to be taken to these agricultural fields while dumping of extremely toxic solvents was in progress.

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites:

Case of Volatile Organic Compounds

- In Cuddalore industrial estate (TN) the VOCs were found being discharged into open environment by several industries.
- SCMC asked CPCB to evolve necessary standards. This is done now.
- Many of the VOCs found in the atmosphere of Cuddalore were found carcinogenic.

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites:

Improvements in CETPs w.r.t HW

- 23 MLD CETP at the cost of Rs. 18 Cr. completed at Tarapur
- 10 MLD CETP at the cost of Rs. 7.26 Cr completed with six months at Buti Bori, Nagpur
- HW Sludge from CETP at Patancharu and Jeedimetla was sent to TSDF.
- Delhi faces a piquant situation. It has CETPs but no TSDF.
- SCMC asked SPCBs to tighten the CETP effluent standards and see that HW does not get in to it.



SCMC found huge quantities of sludge accumulated by Patancheru and Jeedimetla CETPs.

Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites:

Rehabilitation of contaminated ground water aquifers

- SCMC is acutely anxious that in several areas, ground water has been rendered unpotable
- There is threat to public health due to the contamination from HW leaching their toxins into soil



Directions regarding domestic HW

(vi): National Inventory of illegal HW dump sites: Loss of Ecology

- An Authority is urgently required to be set up to ensure that the rehabilitation of abandoned and illegal HW dumps is completed.
- Contaminated underground water resources cannot be let to waste.
- Technologies exist for rehabilitation/remediation.



Directions regarding domestic HW

(vii): Supply of water to communities affected by ground water contamination due to HW

- Faced with the problem of contaminated GW from industrial wastes in Gujarat and MP, the SCMC requested SC to direct the supply of water to the affected communities before the summer of 2004
- SC accepted the plea and issued order on 7th May, 2004
- In Gujarat , the order was complied for 26 villages at a cost of Rs. 5.5 Cr.
- For Bhopal water supply was 40 MLD in affected area around UCIL.



Directions regarding domestic HW

(viii): Waste minimization

- As per HW Rules amended in 2003, SPCBs have been given power to demand proof of waste reduction efforts at the time of grant or renewal of authorization
- SCMC was not able to evaluate the impact of this amendment largely because it was too recent and majority of units had already been granted authorization for a period ranging from 3-5 years.

Directions regarding domestic HW

(ix): Policy document on HW and landfills

- Policy document covering both issues was prepared by the CPCB and circulated in SCMC for comments
- Draft sent to MoEF.
- Policy does not take into consideration the widespread opposition to the location or siting of landfills for HW

Directions regarding domestic HW:

(x): Latest cleaner technologies

- The CPCB was directed to bring the latest cleaner technologies to the notice of SPCBs/PCCs and to require the said Boards/Committees to ensure compliance thereof within six months.
- CPCB has done good work and complied in respect of recycling /reuse of used oil/waste oil and non-ferrous metals.

Directions regarding domestic HW:

(xi): Waste oil transport and waste oil trade

- The waste oil trade is worse today than when the order dated 14.10.2003 was passed.
- Since the issue is indeed very serious, a separate report on it was filed in August, 2007 by Dr. Boralkar and Dr. Claude Alvares for consideration of the SC.



Oil recycling units like the two at the left from Maharashtra and Kerala have to fight for waste oil supplies even while bulk of the waste oil ends up in adulteration. (Below) Recycled oil from one of the units.



Directions regarding domestic HW:

(xii): Implementation of rules relating to plastics and batteries

- SCMC, among other things, recommended minimum thickness of 40 micron for plastic bags and suggested vital role for local bodies in its implementation.
- SCMC was convinced that serious efforts have been made by some of the SPCBs
- Scenario is chaotic from the point of view of large scale illegal imports
- Used batteries (LABs) find way to *kabadiwalls*.
- More work is required for the application of EST and ESM

Directions regarding domestic HW:

(xiii): Implementation of check-lists by SPCBs/PCCs

- The CPCB was directed to prepare and issue a check list to be used diligently by officers of SPCBs/PCCs before the issue of authorization letters under the HW Rules.
- CPCB has sent the check lists to SPCBs/PCCs but SCMC found that second part of the direction not implemented.
- It is amazing that even now there is no uniformity. Matter is left to the individual talent of the Boards with the consequence extremely poorly drafted authorizations continue to be issued.

Directions regarding domestic HW:

(xiv): Upgrading the laboratories at ports & customs

- Rs. 5.1275 have been spent to upgrade Customs laboratories at Chennai, Delhi, Kolkata and Kandla.
- Instruments procured additionally are :
 - TCLP agitator, Zero
 - Zero Head Extractor
 - Karl Fisher titrator,
 - pH and conductivity meter
 - Elemental analyzer
 - Hydride vapor generator
 - Hollow cathode lamps
 - Microwave digester
 - Bomb calorimeter
 - TOC Analyzer
 - Ion selective electrode
 - UV Visible spectrometer
 - AOx analyzer

Directions regarding domestic HW:

(xv): Institutional reforms: Strengthening of Pollution Control Boards/PCCs/MoEF/CPCB

- SCMC did not receive any proposal or report regarding institutional reform being carried out at MoEF and CPCB. Similar is case for most of the SPCBs
- Some Boards created few more posts without much reformation in the organizational structure and function
- Most of the State Boards continue to be headed by non-specialists which is in violation of SC order.

Directions regarding Imported HW & Basel Convention:

(i): Additional controls to prevent imports of HW

- SCMC was unable to pay adequate attention to the situation and to assist authorities with ways and means to halt imports
- India still remains a destination for dumping of waste oil, varieties of plastic waste, metal scraps, clinical & municipal wastes, discarded building materials, used cloths, waste paper and empty pet bottles
- After Court order, the situation was altered somewhat though the almost scandalous & open imports continued



Directions regarding Imported HW & Basel Convention:

(i): Additional controls to prevent imports of HW



Piles of metal scraps and compacted plastic waste found to be imported at SEZ, Kandla. The importers did not have authorizations



Directions regarding Imported HW & Basel Convention:

(i): Additional controls to prevent imports of HW

- Large quantities of waste / used oil coming through ports like JNPT and Cochin under the garb of RPO and other nomenclatures
- Consignments are priced extremely low and move from country to country and often picked up from high sea by Indian importers
- These are then allegedly used for adulteration under the cover of recycling
- ICD Ahmedabad impounded 106.4 MT of waste oil in August 2006
- Wastes lead acid batteries were found illegally imported through Cochin Port
- E-waste is the new illegally import flooding this country. The SC directed CPCB to make random checks.
- No inventories of waste imported
- Amendments in Custom Act and changes in EXIM Policy required

Directions regarding Imported HW & Basel Convention:

(ii): Disposal of HW impounded at Ports and ICDs

- Consignments of waste oils lying at Tuticorin incinerated under TNPCB
- HW at ICD Bangalore sent to TSDF after solidification
- 47 containers of waste oil at MbPT incinerated at TSDF Taloja
- DPCC in association with CPCB was asked to verify HW lying at ICD Tuglakhabad and decide disposal options
- Punjab PCB in association with CPCB was asked to verify and decide in respect HW lying at Ludhiana ICD
- Commissioner of Customs, Mumbai was asked to verify and confirm the quantity of HW lying in JNPT and then decide disposal options in consultation with MPCB

Directions regarding Imported HW & Basel Convention:

(iii): Destruction by Incineration of 133 containers of waste oil illegally imported at JNPT (SC Order dated 5.01.2005)

- 133 Containers moved to TSDF Taloja
- SMC sub-committee supervised
- MPCB ensured that incineration followed norms
- Cost of incineration Rs. 2.86 Cr. Paid by Customs



Directions regarding Imported HW & Basel Convention:

(iv): Directions relating to Dirty Technology Import

- CPCB was directed to do research and to take up the matter with MoEF for requisite regulatory measures in regard to the import of dirty technologies into the country
- SCMC is not satisfied with the routinely submitted information by CPCB relating to meetings, papers, etc as fulfillment of the directions

Directions relating to further amendments to existing laws and statutes:

Amendments to HW Rules, 89

- MoEF complied
- Ministry of Labour and Ministry of Industry was asked to set up special Committee to examine the problems of workers in HW units in terms of their occupational hazards, health and compensation. This was complied.
- Recommendations of the Special Committee not implemented by authorities
- Nether have any provisions being incorporated in the amendments of HW Rules even though this was specifically requested by the Special Committee

Costs of implementing SC Order as received from AP, Maharashtra, Kerala, Gujarat & Other States:

Rs. 1144 Cr. spent by various bodies in carrying out the various directions and committed for approved projects pursuant to the order

Table 12: Expenditures by various bodies to implement the directions in 14.10.2003:

Sr. No.	Name of the organization / Sate	Total amount spent, Rs
1	Andhra Pradesh	170,142,514.00
2	Maharashtra	2,186,380,000.00
3	Kerala	1,714,120,900.00
4	Gujarat	1,041,000,000.00
5	Proposed HWMP (Hyderabad/AP)	540,000,000.00
6	Proposed MWML (Mumbai/Maha)	630,000,000.00
7	Proposed WBWML (West Bengal)	540,000,000.00
8	Proposed MPWMP (Madhya Pradesh)	450,000,000.00
9	Proposed RWMP (Udaipur/Rajasthan)	360,000,000.00
10	Proposed CWMP (Vizag/AP)	540,000,000.00
11	Proposed KWMP (Bangalore)	570,000,000.00
12	Proposed TNWML (Tamilnadu)	1,170,000,000.00
13	Proposed UPWMP (Uttar Pradesh)	1,350,000,000.00
14	Proposed PWMP (Punjab)	180,000,000.00
	Total	11,441,643,414.00



Performance Index of Various States in Implementing the Court's Directions : Rating of the States

Sr.No.	States	Points gained in respect of compliance of SC orders
First Category States		
1	Maharashtra	12
2	Gujarat	12
3	Andhra Pradesh	11
4	West Bengal	8
5	Madhya Pradesh	7
6	Punjab	7
7	Uttar Pradesh	7
8	Tamil Nadu	6
9	Rajasthan	6
10	Jharkhand	5

Performance Index of Various States in Implementing the Court's Directions : Rating of the States

Sr.No.	States	Points gained in respect of compliance of SC orders
Second Category States		
11	Assam	8
12	Kerala	8
13	Chhattisgarh	7
14	Haryana	7
15	Himachal Pradesh	7
16	Jammu and Kashmir	7
17	Karnataka	7
18	Orissa	7
19	Meghalaya	7
20	Daman & Diu & Dadra & Nagar Haveli	7
21	Delhi	7
22	Bihar	6
23	Pondicherry	6
24	Goa	5
25	Uttaranchal	5

Performance Index of Various States in Implementing the Court's Directions : Rating of the States

Sr.No.	States	Points gained in respect of compliance of SC orders
Third Category States		
26	Chandigarh	7
27	Arunachal Pradesh	6
28	Mizoram	6
29	Andaman & Nicobar	6
30	Sikkim	6
31	Lakshadweep	6
32	Manipur	5
33	Tripura	4
34	Nagaland	4

Conclusion

Achievable vision for effective & total management of HW

- The SC Order dated 14.10.2003 has not disposed of the petition
- The Court was aware that the problems relating to HWM within the country were quite complex
- There were several problems still to be resolved with regard to import of HW

Conclusion

Achievable vision for effective & total management of HW

- Considering the gravity of the scenario depicted by the Menon Committee the Court passed a comprehensive order keeping a holistic picture in view which required authorities concerned to :
 - a) Finalize the data available on HW generation within the country and have it posted on public media
 - b) Ensure clean up of illegal HW dumps
 - c) Ensure that conventional scientific solutions like SLF and incinerators are installed and operated as per norms
 - d) Prepare policy on HW and landfills which assume reduction in generation of HW including wastes from abroad
 - e) Ensure citizen's and community participation in HWM

Conclusion

Achievable vision for effective & total management of HW

- The Court came to conclusion that the most important authorities in the scheme of things were the SPCBs which had to be strengthened considerably in terms of adequate and qualified manpower and infrastructure. SCMC was set up to ensure that the systems for this scheme were up and running.
- The picture that emerges from this report is not satisfactory
- Outstanding and impressive work has been done by few players, but many are still far behind

Conclusion

Achievable vision for effective & total management of HW

- Successful States (Gujarat, Maharashtra, AP) have demonstrated that it is possible to implement Court directions and to establish HWM system that minimizes harm to ecology.
- Resources are not the problem, as the major assets (TSDF) are created out of the demands of the *Polluter Pays Principle*
- IT tools can be intelligently and wisely used for better planning and management of HW



Thanks very much!