

POSITIVE DECISION MAKING IN WASTE MANAGEMENT TOWARDS ACHIEVING SUSTAINABLE DEVELOPMENT

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ABSTRACT

Majority of the manufacturing activities in an industry, at times, are also associated with generation of pollution. It is often looked at the Industrial sector being not paying much adherence to their commitments promised before receiving permission for their establishment and operation from concerned authorities of different organizations such as Financial Institutions, Pollution Control Board(s), and local Administration etc. In the present study, an attempt is made to assess the potential causes for the improper waste management by the Industrial sectors polluting environment (here on referred as Industrial polluters) and to come up few suggestions with regards to the role and responsibility of the Statutory Boards in discharging their duties. Need and importance of co-ordination among the Industrial polluters, the local Administration, the Regulatory Agencies and the public is also discussed.

Keywords: Sustainable Development, Waste Management, Environmental Regulatory Agencies, Industrial Polluter.

SUPREME COURT ORDERS CPCB FOR THE CLOSURE OF SELECTED INDUSTRIES [1] !

THE WATER QUALITY OF RIVER YAMUNA HAS DEGRADED AND IS NOT SUITABLE FOR DRINKING PURPOSES [2] !!

BRAHMANI, ONE OF THE ORISSA'S MAJOR RIVERS IS SO POLLUTED SUCH THAT AT NO PLACE ITS WATER IS DIRECTLY POTABLE NEAR ROURKELA AND TALCHER-ANGUL INDUSTRIAL COMPLEXES [3]!!

UNTREATED WATER CREATES SERIOUS HEALTH HAZARDS [4] !!!

BICHHRI'S SAGA: A TRIUMPH FOR THE PEOPLE [5] !!

DYEING UNITS FACE CLOSURE THREATS!!!!

These are the news headlines that we very often come across in the print and/or electronic media, almost on a day-to-day basis.

But,

Should we bother about them or should we not? When the very environment where we live in is becoming polluted, aren't we the sufferers? Let's take a close look of the events that are happening around us and attempt to analyze what should be done.

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WHAT IS THE PROBLEM?

Waste generation is, at times, associated with most of the Industrial sectors during manufacture of their stream of products. The wastes may be solid, liquid or gaseous. The pollution generated by the wastes may induce adverse impacts on air, water, land, noise, flora, fauna and socio-economic environments.

The Ministry of Environment and Forests (MOEF) is the apex administrative body responsible for regulating and ensuring environmental protection in the country. The MOEF has four wings, viz.,

- Environment
- Forests and Wildlife
- Ganga Project Directorate
- National Afforestation and Eco-development Board

The Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs) are the administrative bodies for exercising promotional and regulatory functions under the Air, Water and Environment Acts [6]. The CPCB and SPCBs are here on referred as Statutory Boards while the MOEF and its four wings are referred as Regulatory Agencies.

The industry has to obtain Consent for establishment of the unit stating that, it will implement an exhaustive Environmental management Plan (EMP) to control pollution. The consent will be issued subject to the satisfaction of the SPCB about the proposed

EMP. Depending on the case, the SPCB may instruct the industry to submit a report on Rapid Environmental Impact Assessment (REIA) highlighting the likely impacts of the industry on environment and the mitigative measures employed/to be employed under EMP, DMP and other suggestions floated by Pollution Control Board experts on the same subject. Annexure-1 gives the list of Industrial groups seeking clearance from MOEF [6].

When both parties i.e., Industry and the statutory Board, agree upon the intensity of the problem and the methods of solving it, can the selected Industrial Groups change their stand on the DMP and Post-Project Monitoring (PPM) activities? Why should they let their partially treated waste streams into atmosphere and face the wrath of Public, Legal and Statutory authorities? Few people may argue that, the industry is making an effort to treat their waste streams but that is not what was agreed upon! The condition is that, the industry shall discharge their waste streams treated as per the statutory standards for disposal. The typical water and air pollutants generated from selected Industrial groups collected from literature [7,8,9] are given in Tables- 1 & 2.

For example, the range of BOD₅ levels in distillery effluent vary from 12,230-40,000 mg/L [7] while that of the domestic sewage varies from 125-352 mg/L (under Indian conditions) [7] to 110-400 mg/L (reported in [10]). As the figures indicate, even the partially treated (say, 80% efficiency i.e., 2446-8000 mg/L remaining) distillery effluent is more powerful to cause damage than the untreated domestic sewage. This emphasizes the need and importance of safe disposal of the liquid effluents from Industrial sectors and the same can be extended for the safe disposal of gaseous effluents also.

ARE THEY ILL-EQUIPPED?

What is wrong with Industrial groups? Are they ill-equipped to reduce pollution? Today, technologies are available and exhaustive research is being carried out in the fields waste and risk management. The industry has a choice of appointing Government recognized technical consultants for their waste management problems. The key personnel in most of the industries have technical background and are aware of the potential pollution problems. However, in some industries, the key personnel may not have any technical background except money investment and money rotation. They

take the help of technical persons for execution of their tasks. The actions and enthusiasm of these technical persons will however depend on the support and encouragement of money oriented key personnel in the Industrial group.

Now-a-days, training programmes / workshops / seminars / technical conferences / awareness programmes are being conducted at many parts of the country and abroad. Financial Institutions like Industrial Development bank of India (IDBI), Small Scale Industrial Development Bank of India (SIDBI), State Financial Corporation (SFC) etc. are offering funds for industrial development and for procurement/installation of pollution control facilities.

WHY DO THEY HIDE?

It is observed that, few industrial polluters furnish incomplete information about their industry to the people who approach them in this regard. This may be attributed to their fear that their industry might be closed for not putting up enough efforts in controlling pollution and/or by not disclosing their commercial secrets. It appears that, a considerable amount of insecurity is apparently prevailing in many industries resulting in exploiting only short-term benefits while overlooking long-term ones. In certain cases, the location of industries itself is against the guidelines for siting of industry [5]. Can this be taken as a reflection towards the amount of interest they show for the environmental guidelines?

MOEF has identified 17 categories as potentially polluted Industrial groups. A total of 1556 highly polluting units (industries) are identified under 17 categories [6] in the country, out of which 1118 units (72% of the total units) are complying to the Statutory disposal standards (see Table-3). Iron & Steel (2 out of 9, i.e., 22%), Aluminium (4 out of 7, i.e., 57%), Pulp and paper (50 out of 97, i.e., 52%), Leather (41 out of 70, i.e., 58%), Distillery (102 out of 177, i.e., 58%), and Sugar (256 out of 391 i.e., 65%) are some of the industrial sectors where the scope for further improvement of waste management concept still exists.

Most of the small and medium scale industries might not figure in the 17 categories listed in Table-3. The small and medium scale industries either manufacture first hand products or downstream products from the wastes/by-products of large industries. Industries with a capital investment of less than Rs. 50 lakhs come

under Small Scale Industries (SSI) and beyond Rs. 5 crore under Large Scale Industries (LSI). Capital investment for Medium Scale Industries (MSI) is between Rs. 50 lakhs and Rs. 5 crores [11]. Due to their low investments, the SSI and MSI cannot spend money for waste management. The concept of Common Effluent Treatment Plant (CETP) has been introduced mostly taking these Industrial categories into consideration. Few CETPs are functioning in Hyderabad, Ankleshwar Industries Association, Gujarat and in other parts of the country. Of course, they have their own operational problems with the incoming highly heterogeneous effluents. The common effluent treatment and disposal facilities are really a boon to the MSI and SSI, provided they are utilised to their fullest extent.

POTENTIAL PROBLEM AREAS OF THE INDUSTRY

Generally, we do not see a person hesitating or delaying to take a decision to execute his responsibilities without a proper reason. It may be noticed, environment and its protection is one among the many problems the industry has to solve. Some of the identified direct and indirect problem areas that may hamper the industrial polluter from adhering to his commitments to the Statutory Boards are as follows:

- Market fluctuation for their products: it varies with Government policies and customer requirements
- Stagnation of cash inflows: it depends upon the customers
- Delay in clearance of infrastructural facilities like water, electricity, approach roads, telephone etc. at the factory site: the power and water supply, for example, may vary with the availability of resource. If the industry is located in a rural area, power cut in rural areas is significantly severe during power crisis period
- Finalisation and implementation of EMP/DMP: this involves technical consultants/material suppliers/work contractors etc. The subsequent delays caused in the execution of the job may be attributed to this reason
- Working condition of the machinery: it affects the production output and/or causes improper functioning of pollution control facilities
- Opposition from local public: the local people may complain to Statutory Board, if

they feel the industry is not taking enough measures to control pollution and spoiling environment. Provision of employment to the local people in the factory may also create few problems to the industry's management

- Internal problems with manpower: this is a sensitive issue that is to be handled very carefully. Loss of production time in lieu of internal problems with manpower leads to reduction of production capacity and subsequently to less cash inflows
- Vigilance and directives of SPCB: they keep a close watch on the industry's activities and issue directives whenever necessary. The punishment for failing to attend may vary from cutting the power and/or water supply, cash penalty or imprisonment under Environment (Protection) Act, 1986
- Directives from local Administration: administrative control of the actions of the industry(s) coming under its purview
- Financial clearances from banks
- Clearance of project from SPCB and/or CPCB

From the above discussion, it can be understood that, the major delay in attending the pollution control activities by the industrial polluter, may come from his association with the Government agencies for clearing of – financial loans, technical proposals, needed infrastructural facilities at the factory etc.

ROLE OF REGULATORY AGENCIES

The Regulatory Agencies are the key personnel in implementing the Government's policies and directives. They should keep in mind that, they are placed at the crucial stage of process i.e., examining and clearing a proposal submitted by an entrepreneur for establishing his venture. The SPCB shall persist with stringent guidelines to be followed by the industry and not let the guilty go loose since the result will be felt by the poor public.

The Regulatory Agencies along with the related State Government Agencies (viz., Department of Electronics (DOE), State Industrial Infrastructure Corporation (SIIC), State Industrial Development Corporation (SIDC), SFC etc.) should co-ordinate among themselves, forming a centralized system using available latest communication and information technologies:

- To reduce the delays in clearances of financial loans from the banks for Industrial

development and/or procurement of pollution control equipments

- To verify the actual utilization of financial loans taken for the same purpose
- To reduce delays in clearances for providing infrastructural facilities like water, power, approach roads especially for industries located at rural areas and which will not come under the purview of SIIC, which looks after providing basic infrastructural facilities
- By the speedy but judicious clearances of technical proposals from enthusiastic entrepreneurs for establishing their ventures
- By the closer follow-up of the industrial activities and efforts for implementing EMP/DMP measures complying to Statutory standards for disposal of emissions
- To conduct awareness programs – (1) for clarifying the doubts of entrepreneurs in the clearance of their proposals and the further actions required and (2) to explain the entrepreneurs the purview and the penalties of a new policy/Act, if introduced and being implemented. These might have been partly included and followed under the creation of Task Force Wing and Pollution Awareness & Assistance Centre [12]
- To make use of latest technologies such as Geographical Information Systems (GIS) to identify and earmark the zones for Industrial development

IT'S SO SIMPLE

There could be many reasons that the industry can give for not fully following their EMP/DMP to prevent deterioration of environmental quality. But, we just can't live without a proper environment around us! Occasionally, economics of the proposed EMP may not encourage the industrial polluter to invest. The amount spent on pollution control management is a long time investment. If the loss incurred due to the closure of the industry and other compensatory payments is compared with the cost involved for pollution control management, the latter is very nominal, isn't it?

SUSTAINABLE DEVELOPMENT

Sustainable Development favors judicious use of available resources through steady reductions in wasteful levels of consumption of energy and other natural resources, which can be achieved through improvement in efficiency and through changes in life cycles. It also emphasizes that the

development should not be achieved by risking significant alterations of the global environment that might cause global warming, ozone depletion, acid rain, oil spills, and indiscrete disposal of wastes including hazardous wastes etc [13].

The difficulties being faced by the industry may be due to various factors as discussed earlier and can be effectively handled by proper co-ordination with the concerned Agencies involved in the task. So long as the environment is polluted, the associated problems will keep on drilling us and the Sustainable Development cannot be achieved.

SUMMARY AND CONCLUSIONS

It can be seen from the above discussion that, the industry not taking action towards waste management depends on many aspects which also redefines the role and responsibility of the Statutory Boards towards a clean environment.

The industrial polluter, local Administration, Regulatory Agencies and the public form the four vertices of a stable square structure (carry equal importance and weightage) enclosed in a sphere of environment. The interaction, co-operation and co-ordination should be maintained among them. Then only the equilibrium will be maintained and that is the need of the hour. For achieving Sustainable Development, this square should not get distorted to become a rectangle or trapezium!

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Table-1 Typical characteristics of major water pollutants in the combined effluents of selected Industrial groups^{7,8}

Industrial group	Typical characteristics of water pollutants
Paper and pulp	BOD ₅ = 155, COD = 716, TSS = 3300, Color = 7800 units
Tannery	BOD ₅ = 900, COD = 2760, TSS = 800, Chlorides = 600, Chromium as Cr = 20
Distilleries	BOD ₅ = 12,230-40,000, COD = 27,900-73,000, TSS = 4500-12,000
Fertilisers	Ammonia nitrogen = 700, Urea nitrogen = 600, Total solids = 5400
Cotton textiles	BOD ₅ = 760, COD = 2400, TSS = 1732, Chlorides = 1390
Sugar	BOD ₅ = 300-2000, COD = 600-4380, TSS = 220-800

Note: All units in mg/L except color, which is in Hazen units

BOD₅ = Bio-chemical Oxygen Demand, COD = Chemical Oxygen Demand, TSS = Total Suspended Solids

Table-2 Typical major air pollutants generated in selected Industrial groups⁹

Industrial group	Typical air pollutants
Cement	Dust, SPM, NO _x , SO _x , HC
Fertilisers	SPM, HF, SiF ₄ , NH ₃ , NO _x
Paper and pulp	H ₂ S, SPM, Mercaptans
Steel manufacturing	CO, fumes, smoke, SPM, SO _x , NO _x
Lead smelters	SO ₂ , SPM, smoke, CO, PbO, ZnO
Iron foundries	Smoke, SPM, CO

Note: SO_x = Sulphur oxides, NO_x = Nitrogen oxides, HC = Hydrocarbons,
H₂S = Hydrogen sulphide, CO = Carbon monoxide, PbO = Lead oxide,
ZnO = Zinc oxide, NH₃ = Ammonia, HF = Hydrogen fluoride,
SiF₄ = Silicon tetra fluoride, SPM = Suspended particulate matter

Table-3 Status of compliance in 17 categories of highly polluted industries⁶

Industrial category	No. of units	No. of units complying	% complying
Aluminium	7	4	57
Caustic	25	23	92
Cement	116	95	82
Copper	2	2	100
Distillery	177	102	58
Dyes	66	51	77
Fertilisers	110	94	85
Iron & Steel	9	2	22
Leather	70	41	58
Pesticide	71	62	87
Petrochemicals	49	49	100
Pharmaceuticals	252	215	85
Paper and pulp	97	50	52
Petroleum Refinery	11	9	82
Sugar	391	256	66
Thermal power plants	99	60	60
Zinc plants	4	3	75

List of Projects seeking MOEF Clearance

1. Nuclear power and related projects such as heavy water plants, nuclear fuel complex, rare earths
2. River valley projects including hydel power, major irrigation and their combination including flood control
3. Ports, harbors, airports (except minor ports and harbors)
4. Petroleum refineries including crude and product pipelines
5. Chemical fertilizers (nitrogenous and phosphatic other than single super phosphate)
6. Pesticides (technical)
7. Petrochemical complexes (both olefinic and aromatic) and petrochemical intermediates such as dimethyl terephthalate, caprolactam, Linear Alkyl Benzoate (LAB) etc., and production of basic plastics such as low density poly ethylene, high density poly ethylene, poly propylene, poly vinyl chloride
8. Bulk drugs and pharmaceuticals
9. Exploration for oil and gas and their production, transportation
10. Synthetic rubber
11. Asbestos and asbestos products
12. Hydrocyanic acid and its derivatives
13. Primary metallurgical industries (e.g., production of iron and steel, aluminium, copper, lead, and ferro-alloys)
14. Electric arc furnaces (mini-steel plants)
15. Chlor-alkali industry
16. Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints
17. Viscose staple fibre and filament yarn
18. Storage batteries integrated with manufacture of oxides of lead and lead-antimony alloy
19. All tourism projects between 200-500 meters of high tide line or at locations with an elevation of more than 100 meters with an investment of more than Rs. 50 millions
20. Thermal power projects
21. Mining projects (major minerals) with leases more than 5 hectares
22. Highway projects
23. Tarred roads in Himalayas and/of forest areas
24. Distilleries
25. Raw skins and hides
26. Pulp, paper and newsprint
27. Dyes
28. Cement
29. Foundries (individual)
30. Electroplating

Source: MOEF, 1994, The Environmental Impact Assessment Notification as amended on 4-5-1994, New Delhi [6]