

Common Effluent Treatment Plant: Current Scenario and Challenges in India

K. A.Chitnis^{1#}, Dr. Mrs. A.K.Khambete^{2#}

Department of Civil Engineering, S. V. National Indian Institute of Technology, Surat, 395007,
India

1 chitniskarishma49@gmail.com

2 akk@ced.svnit.ac.i

Abstract: Common effluent treatment plant concept is discussed in this paper for small and medium scale industries. Current scenario for the CETPs in India and challenges for the CETP performance with brief review is also presented.

Keywords: CETP; Effluent; heterogeneous and homogeneous.

INTRODUCTION

Common Effluent Treatment Plant is the concept of treating effluents by means of a collective effort mainly for a cluster of small scale industrial units. This concept is similar to the concept of Municipal Corporation treating sewage of all the individual houses. The Ministry of Environment and forest, Government of India has launched the centrally sponsored scheme, namely "Common Effluent Treatment Plant" in order to make a co-operative movement of pollution control especially to treat the effluent emanating from industrial cluster 's of major objective of the CETP is to reduce the treatment cost to be borne by an individual member unit to a maximum while protecting the water environment to a maximum, the proposal for set CETP by such industries to be submitted by the

CETP association to the respective state pollution control board, while after examine the proposal and commitment from the concerned state government regarding it's contribution will give their recommendation to the Ministry of Environment and forest for consideration, the Ministry examine the proposal and takes the decision through a screening committee constituted in this regard for providing support from the government.

The main objective of CETP is to reduce the treatment cost for individual units while protecting the environment.

- To achieve 'Economics of scale' in waste treatment, thereby reducing the cost of pollution abatement for individual factory.
- To minimise the problem of lack of technical assistance and trained personnel as fewer plants require fewer people.
- To solve the problem of lack of space as the centralized facility can be planned in advance to ensure that adequate space is available.
- To reduce the problems of monitoring for the pollution control boards.
- To organize the disposal of treated wastes and sludge and to improve the recycling and reuse possibilities.

The concept of common effluent treatment plant has been accepted as a solution for collecting, conveying, treating, and disposing of the effluents from the industrial estates.

CETPs are classified in two categories:

(i) **Homogenous:** Industries producing similar goods in that industrial area are contributing. E.g., tanneries, paper, etc.

(ii) **Heterogenous:** industries producing widely divergent goods are placed together. E.g. chemical, dairy, soft drink, canneries, pharmaceuticals, etc.

In India, CETP effectiveness as problem solving tool for small and medium scale industries is topic of discussion. Where some reports indicate cost effectiveness of CETP compared to individual ETP. While other side argues that instead of concentrating on end of pipe treatment philosophy one should consider process modification philosophy. However after process modification also effluent treatment from small and medium scale industries can be treated cost effectively in CETPs rather than individual ETP.

CURRENT SCENARIO OF CETPs

To understand current scenario of CETPs in India, Establishment of CETP in India should be known. First unit of CETP at Pali (Raj.) established in 1983 by RIICO. At the same time, establishment of CETP for tanneries in T.N. taken up by state PSU. CETP at Jeedimetla (A.P.) established in 1989 in phased manner, by industries. CETP at Pattancheru also established in 1989 by forming a company by industries with the support of APIIC. MoEF scheme for funding of CETPs started in 1991 which led to establishment of several CETPs.

State wise distribution of CETPs:

Table 1. State wise Distribution of CETPs

State	No of CETPs	Combined capacity of CETPs, MLD
Andhra Pradesh	3	12.75
Delhi	11	133.2
Gujarat	16	156.3
Haryana	1	1.1
Karnataka	2	1.3
Maharashtra	11	63.25
Madhya Pradesh	1	0.9
Punjab	2	1.535
Rajasthan	8	57.7
Tamilnadu	29	71.15
Uttar Pradesh	3	44.4
West Bengal	1	10
Total	88	559.770

*Source: MOEF (2000)

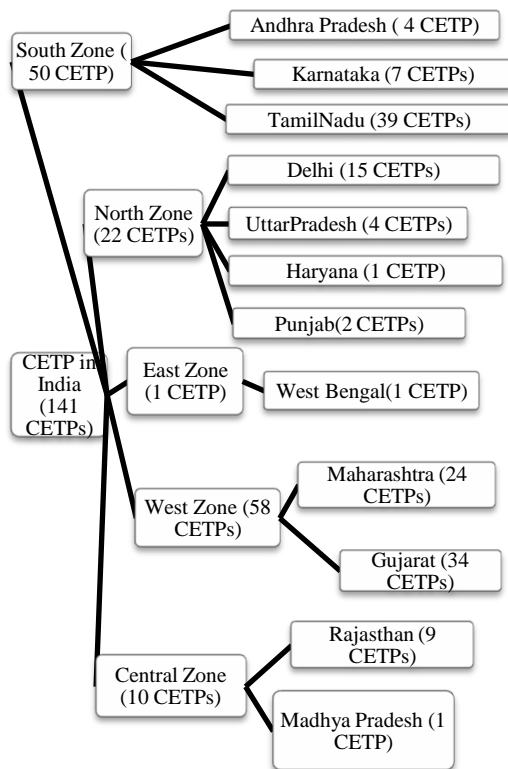


Fig. 1. CETP distribution in India

*Source: Overview of CETPs in India CPCB (2012)

Treatment Process

General Wastewater treatment can be divided into four major categories or steps-

1. **Preliminary treatment** - It involves a number of unit processes to eliminate undesirable characteristics of wastewater. Processes include use of screen sand grates for removal of large particles, comminutors for grinding of coarse solids, pre-aeration for odour control and some removal of grease.
2. **Primary treatment**- It involves removal of readily settleable solids prior to biological treatment. Sedimentation chambers are the main units involved but various

auxiliary processes such as floatation, flocculation and fine screening may also be used.

3. **Secondary treatment**- It involves purification of waste water primarily by decomposition of suspended and dissolved organic matter by microbial action. A number of processes are available but mainly used are land treatment, activated sludge process or the biological filtration methods.
4. **Auxiliary treatment**- This mainly includes large number of physical and chemical treatment processes that can be used before or after the biological treatment to meet the treatment objectives.

Design of the actual treatment system for a CETP involves selection of alternative processes based on the ability of individual treatment processes to remove specific waste constituents. A few anaerobic treatment units in the form of UASB reactors were also implemented and review for this process implemented in CETPs from point of view of effectiveness ranges from ineffective to moderately effective.

Challenges

The Concept of CETP is different from STP in two aspects: homogeneity and biodegradability. Composition of effluents from different industries varies widely depending on process and products. When mixed effluent from different industries the nature of effluent becomes heterogeneous and treatment process becomes challenge. The organic compounds present in industrial effluent are hard to biodegrade compared to domestic waste water. Industrial effluent sometimes contains toxic compound which are easier to treat individually rather than mixed. It is difficult

to efficiently degrade all compounds by stable group of bacteria.

It is possible to separate existing CETPs in to two groups: industry cluster containing relatively homogeneous industries and others with diverse group of industries. Literature reports on such CETPs for clusters of tanneries (Govindasamy et al. 2006).

CONCLUSIONS

An attempt has been made in this paper to review CETP scenario in India and challenges in performance of CETPs in India. Therefore, there is scope of active research and development of suitable solution for mitigating challenges of CETPs in India.

REFERENCES

- [1] Govindsamy P., Madhavan S. D. , Revathi S. and Shanmugam P. 2006 Performance evaluation of Common Effluent Treatment Plant for Tanneries at Pallavaram CETP, Journal of Environmental Science & Engineering, Vol.478,43, pp. no. 213-220.
- [2] Naik D. J. Desai K. K. Vashi R. T. Desai K. C. 2006 Common effluent treatment plant- a blessing for small scale industries at Sachin industrial area, Surat J. Environ. Research Development, 1 (2), 124-128.
- [3] Pandey R. Deb S. 1998 CETPs and pollution abatement in SSIs, National Institute of Public Finance and Policy, A Report.
- [4] Pathe P. P. Kumar M. Suresh Kharwade M. R. Kaul S. N. 2004 Common Effluent Treatment Plant for waste water management from a cluster of small scale industries, Environmental Technology, 25(5), 555-563.
- [5] P W Ramteke, S. Awasthi, T. Srinath, Babu Joseph Efficiency assessment of CETP treating tannery effluent, Environmental Monitoring Assessment,169, pp. no. 125-131.
- [6] Saumyen Guha C harendranath 2013 Common Effluent Treatment Plants(CETPs): the concepts, problems and case study, Directions, 7-15.
- [7] Salunke K.A., Bhawe P.P., Nayak J. 2015 Performance Evaluation Of Common Effluent Treatment Plant At Thane-Belapur CETP International Journal Of Innovations In Engineering Sciences And Technology: Civil, Vol. 1, Issue.1, Pp. 1-5.
- [8] Singh A., Mishra S.K. et. al. 2011 Performance evaluation of Common Effluent Treatment Plant treating Textile waste waters in India Journal of Environmental Research & Development, vol.5A,3,pp. no. 696-706.
- [9] Singh R., Chaudhary R., Malviya K. 2010 Performance evaluation of the common effluent treatment plant and treatability study for the optimization of chemical dosing Environmental Science An Indian Journal, 5(1), pp. no.102-106.
- [10] TOXICS Link 2000, Common Effluent Treatment Plant a solution or problem itself, A report.