

THE GREEN BUSINESS PRACTISES OF INDIAN RAILWAYS (THE BIO-TOILETS: A MORAL SUASION)

Dr.T.THEGALEESAN & Dr.R.LATHA

Assistant Professors of Economics
Annamalai University
(Deputed to Government College)

Abstract

In environmental issues concerned in the Indian Railways system once, the Railway platforms were obnoxious and odours besides when we travelling with drinking and eating in inside the wagons and platforms. However, the situation has been ratified in recent past under the Swatch Bharath programme. In Indian railway, the bio-toilet has been introduced to put check for visual and olfactory pollution by open defecation and draining of the urine and stools in tracks and platforms. The moral suasion is one among them by which the railway brings the bio-toilet measures to eradicate open defecation problem. This study attempts to seek and put checks for the open defecation issues by erecting bio-toilet system in rail boogies involving the cost and benefits. It is a descriptive study. The study period is 2012-2018. An inductive description is given for appraisal of the bio-toilets in Indian railways and the collection of primary and secondary data are used. There are four fiscal methods have been following to control the damage of the environment such as: moral suasion, regulations and controlling measure of the fiscal measures such as subsidy effluent/pollution tax, pollution permits, and allocation of property rights. The moral suasion is a volunteerism and more powerful weapon when we execute anything in public good concerned including environmental issues. The green toilets aim at zero-defecation on the ground

Key words: Open defecation, bio/green-toilets, moral suasion, zero defecations in railways and tracks, Swatch Bharath, etc.

1. Introduction

Lack of sanitation leads to infectious disease, which was first noted scientifically in 1842 in Chadwick's seminal "Report on an inquiry into the sanitary condition of the labouring population of Great Britain" the less scientific but professionally significant indicator of the impact on health of poor sanitation, was focused in 2007. The diseases associated with poor sanitation are particularly correlated with poverty and infancy and alone account for about 10 per cent of the global burden of disease. At any given time close to half of the urban populations of Africa, Asia, and Latin America have a disease associated with poor sanitation, hygiene, and water. Analyzing the problem of health of a population and threats is on the basis for public health issues and this could be done through the surveillance of cases and health indicators. There are so many components in sanitation initiation and these components may otherwise be called as determinants of sanitation. The open defecation is one of the components in sanitation besides water borne diseases, vector borne, compounding the problem of disease exposure and malnutrition in children.

2. Concept of open defecation

Open defecation is the emptying of bowels in the open without the use of properly designed structures built for handling of human waste such as toilets. Open defecation is particularly associated with rural and poverty stricken regions of the world, especially Sub-Saharan Africa and Asia. According to Wikipedia, “open defecation is the human practice of defecating outside in the open. In lieu of toilets, people use fields, bushes, forests, open bodies of water or other open space. The practice is common where sanitation infrastructure is not available. About 892 million people or 12 per cent of the global population practice open defecation.

3. Open defecation and the environment

The environment also suffers as a result of open defecation because it introduces toxins and bacteria into the eco system in amounts that it cannot handle or break down at a time. This leads to build up of filth. Also, the load of microbes can become so great that in the end, they end up in aquatic systems thereby causing harm to aquatic life. At the same time, it can contribute to eutrophication or the formation of algal blooms that form disgusting scum on the surface of the water ways which disturb aquatic life underneath the water by preventing oxygen and light diffusion into the water.

4. Objectives of the study

This study attempts to seek and put checks for the open defecation issues in railway net-work. The moral suasion is one among them by which the railway brings the bio-toilet measures to eradicate open defecation problem. This research seeks those green toilet programmes in the part of government. There are four general methods have been followed to control the damage of the environment such as: moral suasion, regulations and controlling measure, fiscal measures such as subsidy, effluent/pollution tax, pollution permits, and allocation of property rights

5. Methodology

It is a descriptive study. The study period is 2012-2018. An inductive description is given for appraisal of the bio-toilets in Indian railways and the collection of primary and secondary data are used.

6. Railways and open defecation

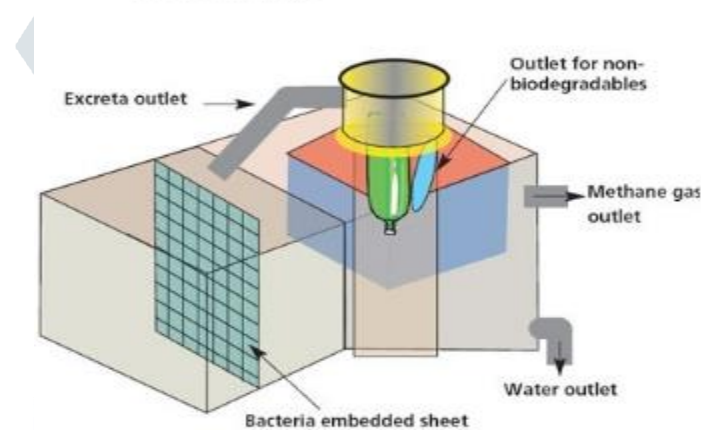
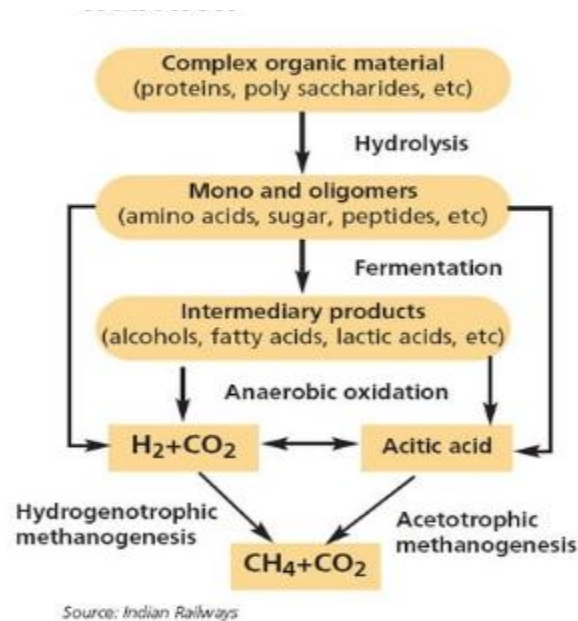
The Indian government is one which comes voluntarily under moral suasion to combat the open defecation in railway bogies and its platforms. Once, the railway platforms were

obnoxious and odours besides when we travelling with drinking and eating in inside the wagons and platforms. However, the situation has been ratified in recent past under the Swachh Bharath programme. In Indian railway, the bio-toilet has been introduced to put check for visual and olfactory pollution by open defecation and draining of the urine and stools in tracks and platforms. The green toilets aim at zero-defecation on the ground. This will improve level of cleanliness at stations; reduce corrosion of rails and rail fittings and consumption of water. Besides, it will also better the working conditions for cleaning and maintenance staff of the railways. This will ensure better cleanliness and hygiene of coaches

7. Meaning of bio toilet

A composting toilet is a type of waterless toilet or micro-flush toilet system that uses a predominant aerobic process to treat human excreta by composting or managed aerobic decomposition. Here human waste decomposed to small pieces in the digester tank using specific high graded bacteria further converting them into methane and methane and water. It is total maintenance-free system and does not require any sewage system. It contains three anaerobic chambers, the human wastes arrive from the toilet's outlet to the first chamber, consequently, the solids drop to the bottom of the tank because of the systematic structure of the bio-digester tank and the high graded bacteria rushes for their job. When this chamber is filled, the water overflows to the second chamber where more of the same happens, except at this time most of the biological/solid matter has been left in the first chamber. When the water overflows into the third chamber, it is almost 90 per cent clean and hence the final stage of digestion takes place. The treatment, the task of cleaning water is continuously carried forward from the start to the end point, till the water exits the bio-digester. When the treated water finally comes out from the bio-digester and into our irrigation pipelines, it is 98 per cent clean and free from entire pathogens. This water is now safe to be used for underground irrigation via pipes buried below the surface. However, the treated water should not be used for human or animal consumption, or for household cleaning without going through additional treatment. According to DRDO, microbial inoculum anaerobic bacteria belonging to four different clusters, namely hydrolytic, acidogenic, acetogenic and methanogenic groups. The first bio-toilet-fitted train, Gwalior-Varanasi Bundelkhand Express, has been running since January 2011. The bio-toilets in the Gwalior express ensure that the undercarriage is clean and without any fecal depositions. The other advantage is that single bacteria recharge works for nearly a year. The anaerobic bacteria used in the green toilets can withstand extreme climates and common disinfectants. T

8. How does a bio toilet work?



9. Bio-toilet cost

The project for installation of bio-toilets in passenger coaches has not yet been completed. The process is still in progress. The additional cost of providing bio-toilets in one coach is 1 lakh rupees so, 4 lakh approximately for one in-service coaches. At present, Indian Railways is operating 27 sections as green corridors and all the trains running on these sections are equipped with bio-toilets. According to the Railway Ministry, installing bio-toilets on trains ensures there is no direct discharge of human waste on the tracks. Each day approximately 4000 MT of human waste is discharged from train coaches. However, with the introduction of bio-toilets in 60 per cent train coaches' commensurate human discharge in open has been eliminated. In January 2011, 57 bio-toilets were introduced one train i.e. Gwalior-Varanasi Bundelkhand Express.

10. Benefits of green toilet

They reduce waste by 90 per cent and convert it into nutrient rich compost. They do not require water hook ups either, which is great for our already stressed water supply. In short, composting toilets are a way to allow waste to decompose safely and without odours. Composting toilets use oxygen loving bacteria that naturally present in human waste to do all the work. Bugs, worms, and other critters have absolutely no role in bio-toilet composting process. You just use a bio-toilet like you would a regular toilet, toilet tissue and all. The main difference is you just toss in the compost mix after each fecal use instead of flushing. The air flow inside the toilet pulls all odours up the 'chimney' and out. The Indian Railways has installed highest ever bio-toilets in train coaches in 2017-18, which is 64 per cent higher than last year, taking the total number of bio-toilets in coaches to 1.25 lakhs. In the bio-toilet system, human waste is converted into liquid and gases. The gases get mixed with air and liquid is discharged on the track.

TABLE 1

The Trajectory Trends of Installation of Bio-Toilets

Year	No. of Bio-toilets Targeted to be Installed	% Extra Work Performed	No. of bio-Toilets Installed
2015-2016	17000	-10	15442 / 17000
2016-2017	33134	64	54979 / 33134
2017-2018	40000	40	56000 / 40000
2018-2019	125000	0	125000 / 125000

Till March 2018, the Indian railway has fitted about 125000 bio-toilets in its coaches. The highest ever bio-toilets in train coaches were installed during 2017-18. The total number of bio-toilets installed in 2017-18 is 40 per cent against the set target of 40000 bio-toilets and 64 per cent against than the set target installation of 34134 bio-toilets in 2016-17. At present, Indian Railways is operating 27 sections as green corridors and all the trains running on these sections are equipped with bio-toilets/green toilets. The installing bio-toilets on trains ensure that there is no direct discharge of human waste and stools on the tracks. This is great achievement for our Indian administration. The expenditure booked Rs.513.97 crores for installation of bio-toilets by Indian railways from 2015 to till December 2017.

11. Conclusion

The 'Make in India' system enabled the bio-toilets in Indian Railways. It has been developed jointly by Indian Railways' Engineers & DRDO's scientists. The initiative is one of the examples of the technology developed for defence applications has been used for civilian purpose. Moreover, the collaboration between DRDO, RDSO and the field units of Indian Railways are facilitated this adaption and large scale deployment of the technology. The moral suasion not only vested with the Railway authority as we are the user have get the same moral suasion in our usage of such dedication sanitation march through green toilet systems installing by our Indian railways. There is no such compulsion for Indian railways either by Government or any international agencies. As this study talks about only single kind of issues that is open defecation, the future research can work on handling the other type of issues like plastic, medical waste, metal, and so on

12. Reference

- Devanjana Nag (2018). Clean Tracks: Indian Railways Installs Record Number of 1.25 Lakh Bio-toilets on Trains. *Financial Express*, April 13.
- Government of India (2008). *Sustaining the Sanitation Revolution*. New Delhi: Department of Drinking Water Supply, Ministry of Rural Development.
- Guerrant, et al. (1992). Diarrhoea as a Cause and an Effect of Malnutrition: Diarrhoea Prevents Catch-up Growth and Malnutrition Increases Diarrhoea Frequency and Duration. *American Journal of Tropical Medicine and Hygiene*, 47, 28–35.
- Hutton, G., Haller, L., & Bartram, J. (2007). Global Cost-benefit Analysis of Water Supply and Sanitation Interventions. *Journal of Water and Health*, 5 (4), 481–502.
- Karpagam (1999). *Environmental Economics*. New Delhi: Sterling Publisher Private Limited, 204-206.
- Murray, C.J., & Lopez, A.D. (1997). Global Mortality, Disability, and the Contribution of Risk Factors: Global Burden of Disease Study. *Lancet*, 349 (9063), 1436-1442.
- Paurush Ambesh., & Sushil Prakash Ambesh (2016). Open Defecation in India: A Major Health Hazard and Hurdle in Infection Control. *Journal of Clinical & Diagnostic Research*, 10 (7).