

Sanitation Problems in Indian Railways

Pawan Parihar
CSE Department
JIET Universe (CO-Ed campus),
NH-62, Pali Road, Mogra,
Jodhpur (Rajasthan), INDIA

Rajat Agarwal
CSE Department
JIET Universe (CO-Ed campus),
NH-62, Pali Road, Mogra,
Jodhpur (Rajasthan), INDIA

Garima Goswami
Deptt. of Applied Sciences(Chemistry)
Universe (CO-Ed campus),
NH-62, Pali Road, Mogra,
Jodhpur (Rajasthan), INDIA

Abstract - Sanitation is always regarded as a key of development intervention. Sanitation generally means to the provide facilities for disposal of human urine and fecal matter. It deals with maintenance of hygienic conditions through services such as collection and disposal of waste. Many diseases are because of lack of sanitation like diarrhea, dysentery, typhoid, malaria and dengue are the outcome of improper or lack of sanitation.

INDIAN Railways, a fast profit making organization and operates as the most densely utilized train system in the world. Railways cover length and breadth of country through its rails. Sanitation in Indian Railways is a big threat to the image of Indian railways. Poor sanitation conditions are a setback to the progressing Railway sector. The existing toilet system in the coaches discharges excreta directly to the ground and on the railway tracks. The factors include unacceptable hygienic conditions, particularly on the railway stations, and damage to rails. A related socio economic problem is that of people residing near the railway stations, without access to toilet facilities, using tracks for open defecation. Open elimination of human excreta through railways, unhygienic toilets, blocked basins, uncleanliness in bogeys and along tracks are the causes that have compelled us to put a thought over sanitation in railways. This human waste on the railway tracks is the main cause of diseases spreading to nearby settlement areas along with delayed decomposition and contamination of water under bridges. This paper deals with a simple solution which will help in the collection of this waste and further process it to generate fertilizers and bio-gas which can be further used to generate electricity which will be sufficient for lightening purpose on railway stations and nearby household locality also.

Keywords: Sanitation, Railways, bio-gas, disposal, toilets.

I. INTRODUCTION

Sanitation is the hygienic means of promoting health through prevention of human contact with the hazards of wastes as well as treatment and proper disposal of sewage or wastewater. Sanitation is always regarded as the key of developmental intervention. It deals with maintenance of hygienic conditions through services such as collection and disposal of solid and liquid waste. Several deadly diseases like diarrhea, dysentery, typhoid, malaria and dengue are the outcome of improper or lack of sanitation all over the world.

The Indian Railways are considered to be a fast profit making organization and operates as the most densely utilized train system in the world. It covers about 105,000 km with more than 8500 stations and carries around 24 million passengers every day, but the major problem which is like a threat to the image of Indian Railways in the country and also in the world is the poor sanitation conditions. Poor sanitation conditions are a setback to the progressing Railway sector.

The toilets in the trains are like small boxes with a hoe, from where the human waste is openly disposed off on the railway tracks. The train toilets have become one of the biggest threats of environmental pollution by spreading the human excreta through the lengths and breadths of the country. Seeing rats moving around the trains and railway tracks is nothing new to get shocked about.

Many passengers ignore requests to not use toilets when trains are not running. This practice leads to clogging of rail lines at busy stations.

There are mainly three reasons of fecal matter generation in IR

- (i) Toilets in trains,
- (ii) Railway stations; and
- (iii) Disposal of human excreta openly on tracks.

II. PROBLEMS DUE TO OPEN SANITATION

Indian railways are drowning in their own excreta produced by passengers. Human faeces is scattered across India's 64,000 kilometers of rail lines.

This human waste on the railway tracks is the main cause of:

1. Diseases spread to nearby settlement areas due to the mosquito breeding.
2. As the lines and surroundings are of iron, stones and pebbles so there is a possibility that the waste is not decomposed and will stay on the tracks for long time and that is going to spread foul smell specially on the Railway platforms where millions of the passengers waits for their trains.
3. Produce health risks if the train is passing over a public waterway or near human settlements. It can contaminate the water and the surroundings.
4. Apart from the issue of cleanliness, this has several dangerous implications arising out of corrosion of rails and related hardware.

So how can we improve the sanitary condition which is a big environmental problem?

III. PROPOSED IDEA

The proper disposal of this waste is not only necessary but at the same time very difficult.

This idea may lead to a solution which helps us to collect and utilize the fecal matter disposed in open.

This disposed matter can be processed to generate fertilizers and bio-gas which can be further used to generate electricity which will be sufficient for lightening purpose on railway stations. With this advantage, railway station will remain neat and clean and the waste will ultimately become the energy provider for the railway platforms and the nearby people.

(A) What can be done for proper sanitation? degradable wastes which are usually found on the platform Every train will be equipped with a special waste and near the tracks are thoroughly mixed. After this, the

collection compartment made of chemicals at the last of the train connected to every toilet by the pipe. This compartment is essentially a well-designed box which will hold the waste when the train is in motion in the main city. As the train is about to enter the main city i.e., when train is 20 km away to enter the city, then the excreta or human waste will start going in this compartment attached to it. And the waste keeps going in last special collection box till the train exits from the main city and is in the less populated

In this way waste would be collected in last compartment of train just after guard coach.

This waste will in turn be transferred to the processing units which can convert this bio waste into bio-gas. This processing unit will be the point where waste from railway, animal wastes, rotting plant wastes and all other decomposable waste will be collected and processed in a bio-gas plant. This would result in a manufacture of bio-gas. By this gas we can generate electricity which will be sufficient to lighten the railway stations and nearby locality also. If the manufacturing of bio-gas is done on large scale then it can be used as a fuel or in our gas stoves for heat generation purposes .

(B) How it is going to work?

The mechanism includes additional storage tank having same dimensions that a normal bogey has in trains, having a controlled outlet through the pipe. This storage tank inlet is connected to the outlet pipe of the present system. This storage tank is made with the use of material and chemicals that can hold the human excreta for a long time without getting corroded and which seals the tank from which no foul smell can escape.

When the train will be 8-10 km away from entering the main city (posh area), that time the valve will be closed so that no human excreta can go through outlet pipe to the railway tracks. Now the human waste that was going to the railway tracks will be collected in last compartment. And also at the time of halt of train on railway stations the waste is going to be collected in the storage tank. The outlet valve of existing system is not opened till the time the train exits from the main city and enters into the forest areas. Also when the train is going to go over through the reservoir or some other water body the train pilot will close the outlet valve to stop the human excreta to go in open. As the waste level is also displayed to the train driver, when the train arrives to the station, then it will be immediately emptied. This waste will go to mixing tank. Here the other bio-

collected waste will be send to bio-gas plant where the bio-gas, bio fertilizers and other gases are produced. Bio-gas can be used for cooking in the pantry cars. Further, Bio-gas is transferred to power house where it is used to produce electricity.

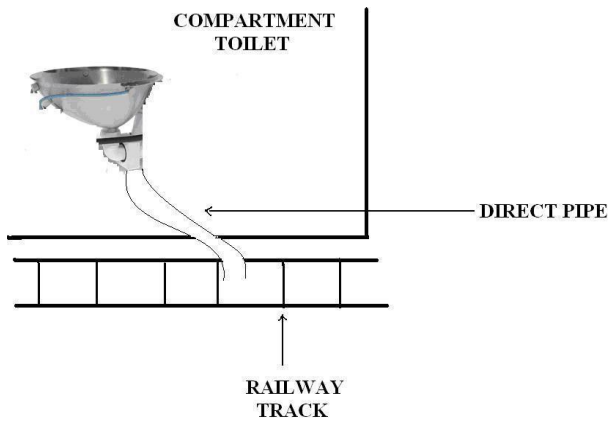
Indian Railway is heart of the Indian transportation. More than 2 million people use trains to find their way. A large amount of the excreta is collected near the railway tracks.

areas.

In this way, we are managing the human waste and making the Railway stations as well as city clean and ultimately we are converting it into Bio fuel which is more efficient than Liquefied Petroleum Gas (LPG). Finally, we are lightening the railway station also from the electricity produced by this management.

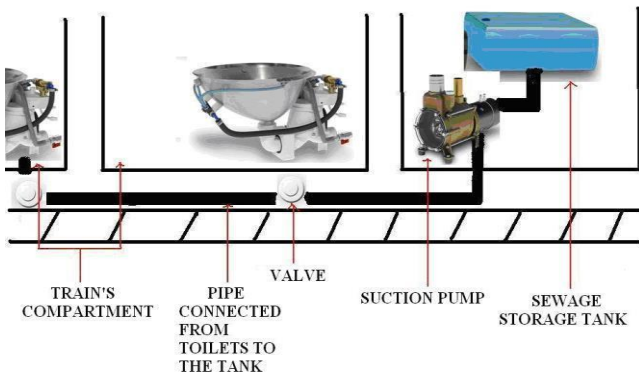
(C) DIAGRAMS

EXISTING TOILET SYSTEMS



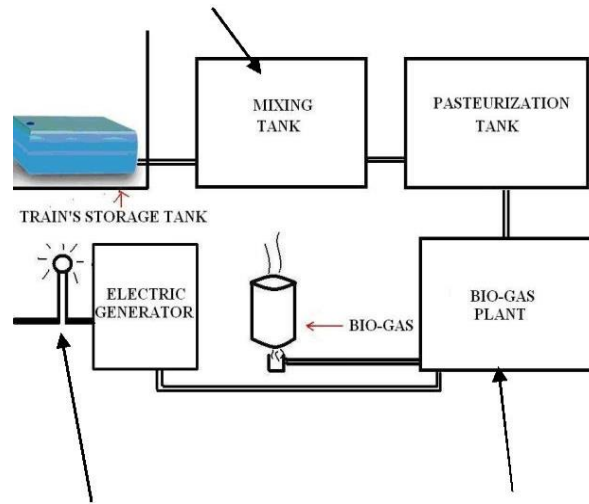
Lightening of railway station

Bio gas generated



AFTERWARDS, ON RAILWAY PLATFORM ...

All Bio Degradable waste of railway system will be mixed here



IV. CONCLUSIONS

Sanitation in Railways and its cleanliness is an important aspect for Indian Railway's complete success.

The main applications of this idea are:

1. To make railway stations and tracks hygienic so that people didn't suffer from it.

SUGGESTED SYSTEM 2. To utilize the human waste for bio gas and then further in generating electricity.

3. Human waste can be used to make fertilizers.

4. Railway tracks will be protected from getting corroded due to human waste.

5. Diseases will not spread in nearby slum areas and localities.

6. Railway stations will become clean.

It will not only help in making railway tracks and stations neat and clean, but also will grow economic growth of India. The big threat that can ruin the image of Indian Railway will be reduced.

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