

# PROJECT SURAKSHA

*‘Without sanitation workers, we won’t be able to live in cities or even villages in a clean and healthy way.’*

It is estimated that five million people in India are engaged in sanitation work (that is, work relating to the cleaning and management of toilets and human excreta), of which two million are likely to be engaged in 'high-risk' work such as cleaning sewers and septic tanks.

Sanitation workers bear the multiple stigma of offensive and unclean work, low wages and a highly dangerous form of employment that results in long-term health impairment and an unacceptably high chance of accidental death. Sanitation work in India has a long association with caste-based oppression. Almost all the sanitation workers who deal with human excreta are from certain Dalit castes and communities. Such work can also be extremely dangerous: excreta contained in enclosed spaces create a mix of poisonous gases (methane, hydrogen sulphide, carbon monoxide, sulphur dioxide, ammonia, nitrogen dioxide and traces of carbon monoxide) that can result in loss of consciousness and death. Safai Karamchari Andolan has recorded close to 2000 sanitation worker deaths, but experts believe that actual figures could be even higher if a complete count was possible.

Moreover, much of this sanitation work is performed in degrading and demeaning conditions, and for low wages and in insecure working conditions. These poor conditions reflect the continued indifference of the society at large, and an incomplete understanding on the policy side of what the sanitation challenge consists of. It has been found that many of these workers consume alcohol prior to their working hours as they won't be able to do this work if they are mentally alert. Crucially, workers (and the families of sanitation workers) remain trapped in circumstances in which they have to keep performing unsafe and humiliating sanitation work, in spite of the heavy price they have to pay for it.

In India, between 2017 and late 2018, one sanitization worker died every five days. The number of sanitation workers who die is nearly 600 a year which is 10 times more than soldiers dying on the battlefield.

Here comes in Project Suraksha.

We consider the issues and challenges of sanitation workers who deal with human excreta, and in the maintenance and management of sanitation infrastructure.

We aim to improve the life of the sanitation workers through our robots. The main idea behind our robots will be efficient waste management without human loss. Artificial intelligence powered industrial robots will be used for waste collection, segregation and safe disposal in the open sewage canals, personnel and private lavatories. The robots will have two modes of operation, one being the waste collection mode while the other being waste segregation mode. Unlike human beings susceptible to various health hazards, robots will have an efficient working capacity. The robot will be able to collect the waste floating (collected) in the sewage water and then transfer to its load i.e., a cylindrical bin with an additional piston provided. The set up provided can be used to drain off the excess water present in the waste. Once the limit is achieved the robot is to dispose the waste collected in a disposal tub where the further segregation is to take place. The robot can be then switched to the segregation mode instead of waste collection mode. Thus we can now turn on the battery saving mode as the bot need not loco mote. It can now successfully segregate waste through machine learning implementation. The separated waste can then be safely disposed after taking appropriate measures. To make it environmental friendly, it would be powered by solar energy. Water resistant solar panels can be provided.

The major disadvantage of our project will be the unemployment caused for the sanitation workers. We can then provide better fields of profession in which they can outshine.

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