Ultra-light Toilet Technology:

Mohd Faiz Ansari[1], Abdul Mannan[2], Nadeem Ahmad[3], Farhan Ahmad[4], Akash Kumar Singh[5], Dr. Manu Shrivastava[6], Kalpana Gupta[7]

IMS Engineering College

Abstract

A toilet is a sanitation unit used for the storing or dumping of human urine and faeces. Toilets may or may not contain a flushing system (flush toilet or dry toilet). They can be installed for two types of postures one is the sitting posture while the other is squatting posture (squat toilet). Flush toilets are fastened to a sewer system in most metropolitan areas and to septic tanks in less built-up areas. But these toilet are costly and non portable systems.

The purpose of developing this project is to produce a light, cheap and portable toilet system, which can abolish the cause of open defecation in our country. The ULTT is an eco-friendly toilet technology which is manually operated. This technology is a mobile system that can be carried easily from one place to another after converting it into trolley bag. Hence, this technology may become a vital solution for Swachha Bharat Abhiyan. This system is quite simple and easily affordable as compared to the existing technology.

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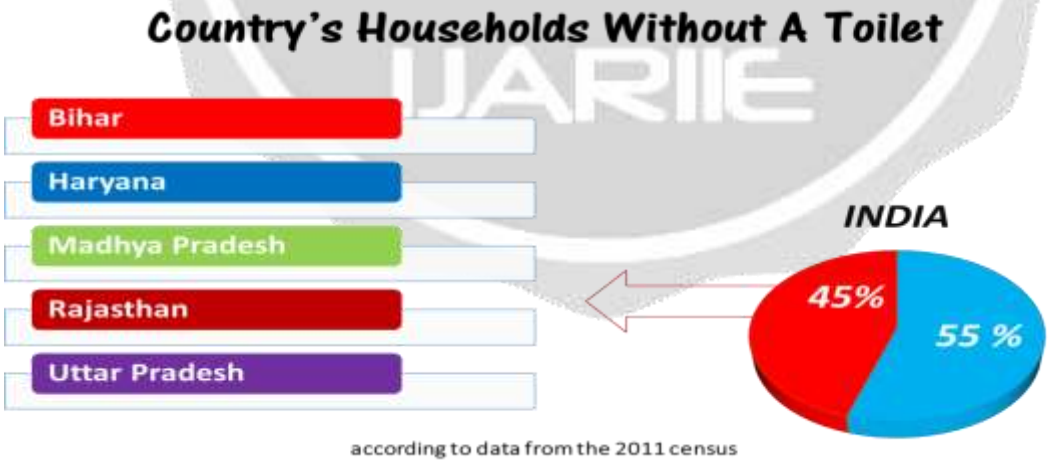
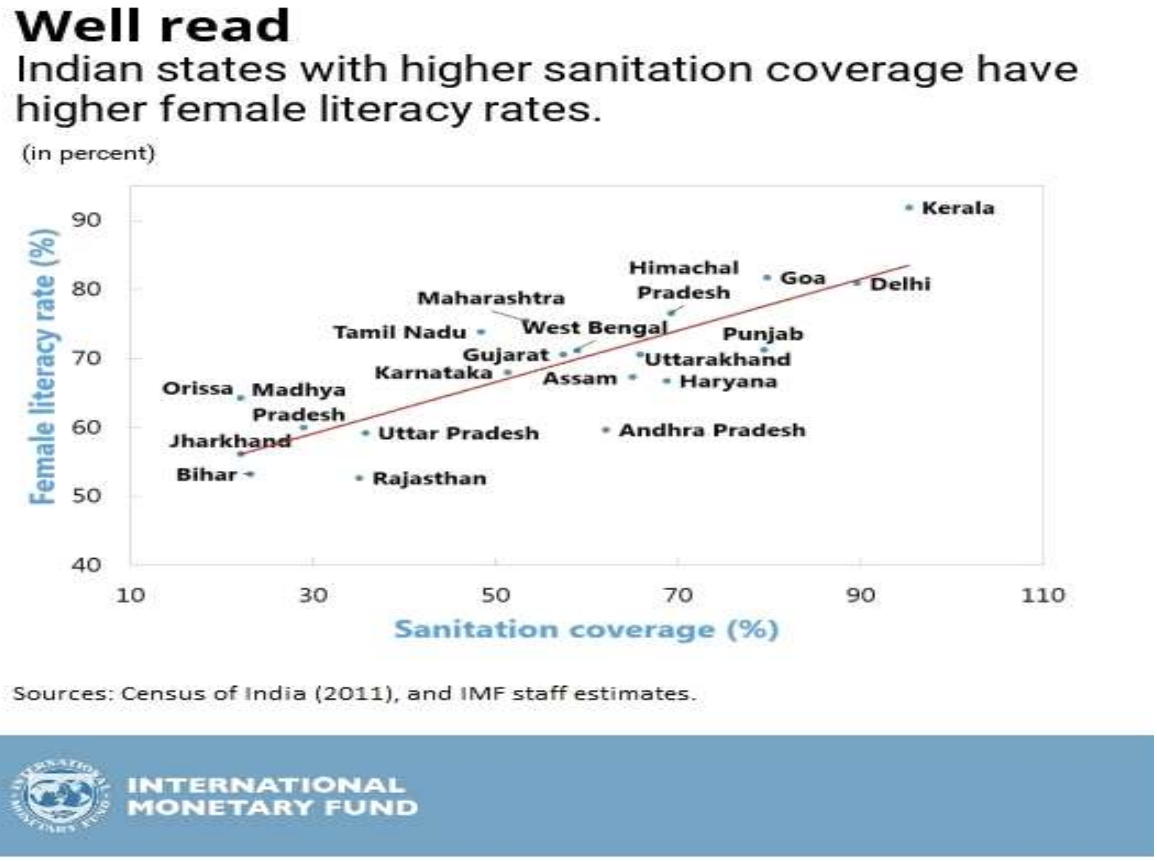
1 Introduction: India has a problem with toilets: Every second person relieves themselves outdoors, a centuries-old practice that contributes to child malnutrition, economic loss and even violence against women[1]. In the report, India ranks first on the list of the world's top ten places with the longest queues for toilets.

*"*Many people regard open defecation as part of a wholesome, healthy, virtuous life*,"* a recent study conducted in Bihar, Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh found. Researchers at the *New Delhi-based Research Institute for Compassionate Economics* added that the practice is "not widely recognized among rural north Indians as a threat to health." Those five northern Indian states account for 45% of the country's households without a toilet, according to data from the 2011 census**.** But even in homes where toilets were installed, many people still prefer to go outside



The RICE study found that out of 3,235 rural homes, 43% had a working toilet. Of those, over 40% had at least one member of the household who nevertheless opted to defecate in the open. When asked why, almost 75% said they did so because it was pleasurable, comfortable and convenient[2]

According to the World Health Organization, 1.1 billion people in the world relieve themselves in open areas[3].For the 2.4 billion people who don't have access to basic sanitation, that lack of toilet facilities[4].



2 Need for the project

A better technology is needed that can fulfill the requirement of toilets in Hilly, Flood prone, Drought and less built-up areas.

2.1 Downside of present technology

The old toilets technologies are not only costly and non portable but also they required more space to get installed. Moreover, these toilets became incompetent during flood and drought.

2.2 Enhancement Required

The old technology must be a portable system which should be cost effective and occupy less space. It should be an Environmental friendly which is easy to use and Suitable for flood and remote areas. A technology is required that can fulfill the requirement of toilet in Hilly, Flood prone, Drought and Remote areas and also for military troops, so as to abolish the execution of Open defecation.

3 Research Methodology

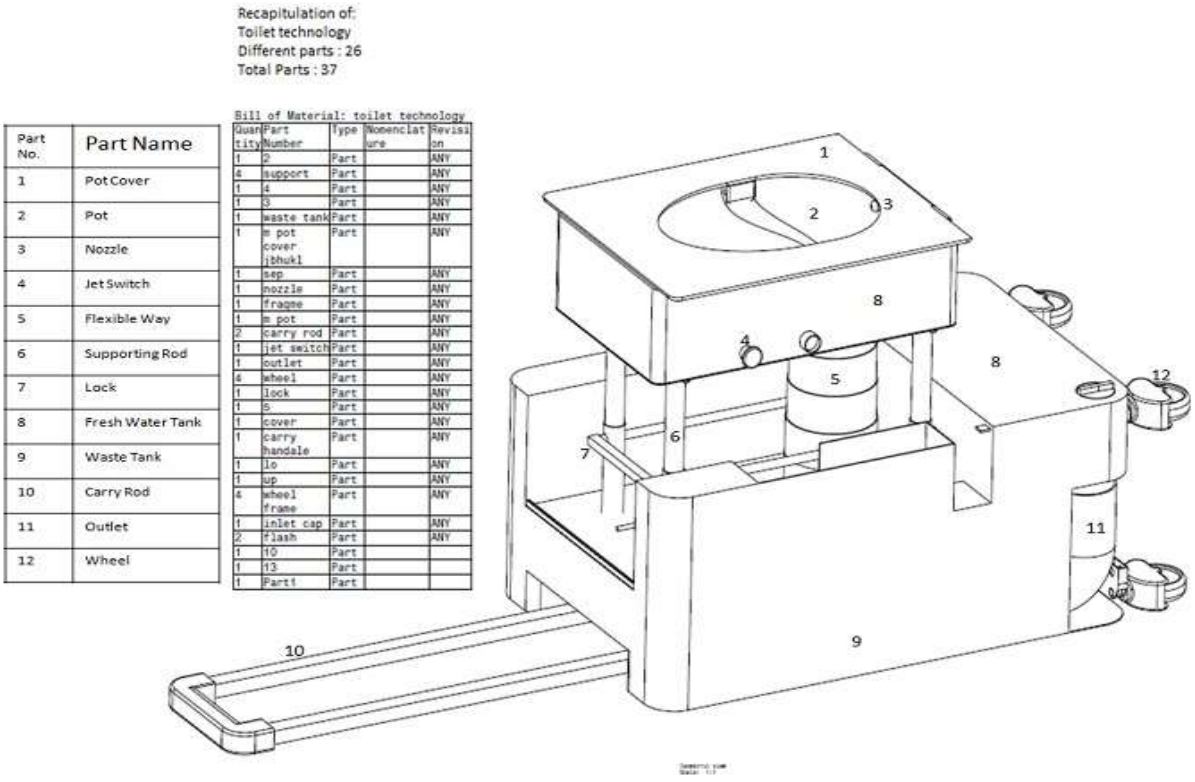
The Ultra-light toilet technology is an advanced technology of existing portable toilet technology. This technology involve following steps

3.1 Design:

The design of the ultra light toilet technology is being carried on Catia V5 designing software. This toilet system is highly compact. Moreover, to make it easily carriable the shape of this toilet can be converted into a trolley bag when not in use. This toilet technology has a different section for storing the fresh water and waste product. This waste product is again separated (with the help of separator) and stored into two chambers named as solid waste storage and liquid waste storage. Fresh water is used for cleaning purpose while the liquid waste water is used for flushing purpose after adding suitable disinfectant.

3.2 Location and community

The Ultra light toilet technology can be an alternate solution for those places where there is a shortage of land (hilly and rocky areas). It will be like *killing two birds with one stone* because it will allow the people to defecate in open indirectly and also maintain the myth of the 75% people those who think that open defecation is pleasurable. Further, it will be a highly feasible article during natural calamity mainly during flood and drought. As in most of the houses in India the toilet are installed at ground floor so these toilet becomes futile during the flood condition. While in drought areas there is always a shortage of clean water hence ULTT can be better alternative as it includes a water recycling process in which treated water is again used for flush. It can also be used while travelling, camping etc.



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3.3 Comparison of Existing and Proposed Technology

FEATURES	EXISTING PORTABLE TOILET	ULTRA LIGHT TOILET TECHNOLOGY
Mobility	The most of the existing portable toilet system lack mobility and hence difficult to carry	The ULTT is a mobile system which can be easily carried out from one place to the other
Weight & size	The portable toilet system are quite bulky and have large weight which make it difficult to carry	The weight of ULLT is (approx.) are quite simple and can be easily handle by an individual
Additional	The current mobile toilet system lack important accessories such as water for	The ULTT have these additional accessories which

accessories.	cleaning etc	make it a more friendly to the user
Flexibility	The portable system lack of flexibility and hence difficult to handle	This system is highly flexible that it can be made into a toilet seat and after being used it can be converted to a trolley bag and hence is a flexible system and can be made to use as per the requirement
Compact System:	The existing system are bulky and hence require lot of space	In India usually in remote areas or hilly areas people have very less space the existing latrine system require more space and permanent space. Hence it become the root cause for the people not having toilet system. Therefore Ultra light toilet technology is designed keeping in mind about is compactness
Smart technology	The separation of solid to liquid waste is difficult to carry in this current portable toilet system	A smart toilet technology is required which can separate the solid and liquid waste with less effort so that the proper disposal of waste can be done. The ultra light toilet technology require small manual effort to separate the solid and liquid waste

Conclusion:

Ultra-Light toilet technology is very portable and simple in functioning. The design is such that everyone is able to use it without any difficulty. It get repair and assemble with ease and hence this lead to low maintenance cost of the system, due to this below poverty line people can easily afford this system. Its working is very smooth. The toilet take the shape of trolley suitcase on dismantle, which is very compact. Frequency of use is approx. 15 people. It is a weather proof technology. It get in used anytime, anywhere when needed. For military troops it become very easy when there is needs to address nature's call during transit with this technology. This project helps in improving the quality of life or alleviation of drudgery of the people and therefore has a great impact on the society.

Hence, we can conclude that this toilet technology can fulfil the is the dream of SWATCH-BHARAT AND SWASTH-BHARAT.

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