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Mohit Monga
Gulpreet Kaur
Madhu
Kajalpreet Kaur
Manisha
Amardeep Singh
Neeraj Yadav
Subhadip Sen

EXECUTIVE SUMMARY

In most of the highly developed countries, 80% of sewage and wastewater is released to the environment without any treatment, which have influence on human health, quality of life, standard of living of the people residing over there, economic productivity, quality of freshwater resources and it degrades aquatic ecosystem also. This problem mainly arises due to lack of physical infrastructure like the sewerage or the on-site sanitation system which leads to the above problems. In a developing country like India, the problems related to wastewater management and reuse arises due to the various factors like lack of treatment, lack of infrastructure and lack of capital investment. The 2011 Census of India has indicated that nearly 17 million urban households lack access to adequate sanitation. Main focus is on the 1st and 2nd class town, however, the other towns are deprived of sanitation facilities. So in this context, the topic Faecal Sludge and Septage Management is chosen which deals with the on-site sanitation facilities and provides proper facilities in the non-skewered areas.

Faecal Sludge and Septage Management is a decentralized sludge and septage management process which includes mainly five components and together form a faecal sludge value chain. Faecal sludge and septage management is the only affordable and sustainable technique as compared to centralized sewerage system and can also be implemented quickly to make cities clean and healthy. FSM is a very important approach providing the improved sanitation.

The town which has been selected for the research is Raja Sansi which is a Nagar Panchayat in district of Amritsar, Punjab. It is a class IV town in the sub district Ajnala. It lies on the main arterial road known as Ajnala Road. It is least populous nagar panchayat of Ajnala sub district. The geographical area of the town is 4 km^2. Raja Sansi town is divided into 13 municipal wards. The town has a total population of 14,298 and 2898 households with an average of 5 persons in each family.

The sanitation situation in the town is very bad. According to the Census of India 2011, in the town only 58.83% of the households have toilets which are mostly connected to septic tanks i.e 35.19% and 64.80% have pit latrines. Raja Sansi does not have any City Sanitation Plan (CSP) for their municipality. Town has already

started the work for the preparation of Detailed Project Report for the sewerage network in the town.

However, this project report have been prepared five years ago but it is not yet implemented due to the various restrictions by the Airport Authority. The geographical slope of the town is towards the runway of the Guru Ramdas International Airport and they do not gives the permission of the sewage being collected over there.

In the town Raja Sansi 86% of the total households having toilets within their premises and 14% of the households do not have any household toilets because of lack of lands availability, funds and land tenure issues. Remaining 14% of population is using community/public toilets or they are practicing open defecation, which creates the smell in the environment. Out of 14%, 65% of the households are still practicing open defecation in the town, however, the town has already been declared as open defecation free, but still households having no toilets practice open defecation, especially in ward 8, 10 which are near pond. Around that area the quality of drinking water is very poor and even that water is not suitable for drinking.

These wards are the most critical wards in terms of open defecation. Ward no. 3,4,5,6 have 100% household toilets because these wards are newly constructed and don't have any septage related problems. Ward 1,2,7,8,9,10,11,12,13 are old wards and almost 20% of population don't have toilets facilities. Nagar Panchayat is providing very less funds for the construction of household toilets i.e only rupees 6000 due to which many household toilets are poorly constructed.

In the town Raja Sansi, the sewage generated from the houses is collected in the septic tanks. The septic tanks are with and without soak pits. Out of the total households only 72 percent of the households have the septic tanks and the rest 28 percent dispose of the sewage from the houses directly to open drains. Such a situation in the town creates many issue related to health, environment and it also affects the aesthetics of the town. In 28% of households, 90% of the toilets are directly connected to open drain and others have pit latrines. Such poor conditions in the town are the major reason for the unhygienic conditions in the town.

Large proportion of the population is dependent on septic the tanks but still they are not properly maintained by the households. Desludging frequency is observed to be

invariably low (once every 8-10 years). Desludging is primarily done by the private operators. The town is served by one or more private operators. For the desludging of septic tanks in the town the Raja Sansi, the Nagar Panchayat has signed a contract with the private operator of time period 6 months, which has now been terminated. Most of these trucks have a faecal sludge storage capacity of around 3500 L to 4500 L. However, the inaccessible areas of all these towns continue to depend on non-mechanical desludging. The desludging user charges also vary greatly from mechanical to non-mechanical. Main mode of desludging is non mechanical i.e. 69% of the desludging is done manually which is against the law of Manual Scavenging Act, 1993. The reasons for illegal manual scavenging is the easy availability of labour form ward no- 8, 10, 12 and 13. However, private trucks for cleaning septic tanks are coming from a distance of 10 km and they are sometimes even not available. Therefore, people prefer to get cleaned their septic tanks manually by easily available labour in town.

There is very little awareness on the need for treatment of faecal sludge amongst all the stakeholders interviewed in the process of data collection in the town. Neither was wastewater treated in the town.

Desludging which is done either manually and mechanically by sanitary workers, dispose the septage along the roads, drains, open land and the ponds. The main disposal system of Raja Sansi is in the municipal drain. 78% of households those who have a septic tank and those who haven't generally dispose the septage and the septic tank outlet to the open drains. The drains are along with both side of the roads in most of the wards and connected to the municipal drain which runs under the runway of Amritsar airport which is in very poor condition. In ward no. 1, 8, 9, 10, 11 and 12 are the most critical wards (refer map-4.4) in terms of disposal because, 95% of the households are not having septic tank therefore, the septage approximately 119.37 KLD is disposed to the open drain. The drinking water condition along these wards is very poor. The characteristics of the sample analyzed, show that the total dissolved solid is more than 500 mg/L but less than maximum permissible limit i.e. 2000mg/L. The two samples are not potable as evident by suspended solids, sample will fail Turbidity test.

Than after analyzing the existing situation, proposals are given as per the increased requirement over the next ten years. Assessment of the financial status of the Raja

Sansi Nagar Panchayat has been done. The proposals are given as per the process of the sanitation value chain. As there was no existing treatment facility in the town, so now DEWATS have been proposed which is a decentralized treatment system and from the treated sludge, the manures are produced which will enhance the quality of soil when used for the agricultural purposes.

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List of Abbreviations

Abbreviations	Full From
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BIS	Bureau of Indian Standards
BOD	Biochemical Oxygen Demand
CEPT	Centre for Environmental Planning and Technology
CSPs	City Sanitation Plan
CPHEEEO	Central Public Health and Environmental Engineering Organization
CPCB	Central Pollution Control Board
DEWATS	Decentralized Wastewater Treatment System
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge Treatment Plant
FS	Faecal Sludge
Gol	Government of India
IS	Indian Standard
lts	Litre
Lpcd	Litre per capita per day
Km	Kilometre
m^3	Cubic Metre
MHRO	Ministry of Human Resource Development
MC	Municipal Corporation/Council
MoEFCC	Ministry of Environment, Forests and Climate Change
MoHUPA	Ministry of Housing and Urban Poverty Alleviation
MoUD	Ministry of Urban Development
NUSP	National Urban Sanitation Policy
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
ODF	Open Defecation Free
PT	Public Toilet
LSG	Local Self Government
STP	Sewage Treatment Plant
SAAP	State Annual Action Plan
SBM	Swachh Bharat Mission
SFC	State Finance Commission
SS	Suspended Solids
UT	Union Territory
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	Urban Local Body
WWTP	Wastewater Treatment Plant
WHO	World Health Organization

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