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Ensuring occupational safety of desludging operators through a hierarchy of controls

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**EQUITABLE AND SUSTAINABLE WASH SERVICES:
FUTURE CHALLENGES IN A RAPIDLY CHANGING WORLD**

**Ensuring occupational safety of desludging operators
through a hierarchy of controls**

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Background

Faecal Sludge Management (FSM) as an economical and sustainable complement to network based systems has been gaining traction in recent years in Tamil Nadu. In this growing space of work, the occupational safety of desludging workers transporting sludge to the treatment systems is a component which requires greater attention. In spite of the introduction of mechanical systems for desludging there is a critical human element involved in this process and workers are still prone to physical injuries, skin infections, exposure to harmful gases, skin burns and other medical emergencies. An earlier study identified a broad set of measures for occupational safety¹. This paper presents the next step of this study, where the feasibility of these measures has been identified and published² to understand the desludging process, corresponding safety concerns and explore possible course of action for addressing safety concerns.

Study approach

The established hierarchy of controls approach, including Mitigation (elimination and substitution), Prevention (to include administrative and engineering controls) and Protection (Personal Protective Equipment (PPE) was adopted to address the safety concerns of sanitation workers (CDC, n.d.). In general, provisioning of PPE has been the priority in the case of safety of sanitation workers but this study expanded the scope to equally prioritising prevention and mitigation measures. To operationalise these measures the study involved in-depth discussions with desludging workers, communities and experts, detailed documentation of the de-sludging operations and field-testing of all recommended PPE and tools.

Elimination & substitution: In-depth discussions with workers highlighted that occupational safety is entrenched in larger societal and behavioural issues. Thereby, to start with, awareness trainings and behaviour change campaigns were conceptualised to i) Address awareness of sanitation workers; ii) Sensitise households on not throwing non-degradable objects causing septic tank blockages which necessitate manual intervention, and on replacing chemical cleaning products which possibly instigate formation of harmful gases in the septic tanks; iii) Capacitate masons on safe construction of containment systems (to protect workers); and iv) Educate de-sludging workers on safe de-sludging operations using PPE and safety tools. These initiatives set the enabling platform for workers to understand and easily adopt recommended safety practices, tools and PPE.

Engineering and administrative controls: The analysis of the de-sludging process revealed inherent risk points in the absence of safety tools and safe operating procedures. The process of blockage removal and assessment for gases were identified as critical safety concerns which required risky human interventions in

¹ Gautam et. al. (Forthcoming)

² The findings from this study has been published in the Journal of Environment Management (JEMA).

the absence of effective tools and processes. The study identified and field tested specific set of tools such as motorised outdoor drain cleaner, desilting collection tools etc. which remove septic tank blockages, and different types of gas monitors to safely assess harmful gases. Additionally, generic safety tools which included caution tape and foldable cone barriers, flex tape, and torches were also recommended. Standard safety operating procedures for operationalising a safe de-sludging process and a set of safety protocols to ensure correct usage of recommended tools and PPE have been developed based on the detailed documentation of the de-sludging operations.

Personal Protective Equipment (PPE): In terms of PPE, worker preferences to utility on ground without deterring speed and quality of work was prioritised for selection and subsequent field testing with workers. The field testing with workers helped indicate the priority set of PPE namely gloves, masks, gumboots, goggles and reflective jackets as well as their existing design issues hampering utility. These issues highlighted the scope for re-design of PPE and the study has initiated design adaptations to existing PPE to ensure their better utility in tandem with other recommended safe operating procedures and de-sludging tools.

Conclusion

The informal nature of the desludging operations influenced the study to prioritise preventive and mitigating measures emphasising awareness, trainings, safety protocols and behaviour change campaigns in equal scale with protective measures of provisioning PPE and safety tools. Additionally, simple communication materials and trainings using multimedia to easily penetrate worker communities is key to disseminating information and sustaining occupational safety amongst the desludging community.

References

CDC. (n.d.). Centre for Disease Control, and Prevention. Workplace Safety and Health Topics. Retrieved June 25, 2020, from <https://www.cdc.gov/niosh/topics/hierarchy/default.html>.

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