

## Practical Paper

### eSOS<sup>®</sup> – emergency Sanitation Operation System

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#### ABSTRACT

This paper presents the innovative emergency Sanitation Operation System (eSOS) concept created to improve the entire emergency sanitation chain and provide decent sanitation to people in need. The eSOS kit is described including its components: eSOS smart toilets, an intelligent excreta collection vehicle-tracking system, a decentralized excreta treatment facility, an emergency sanitation coordination center, and an integrated eSOS communication and management system. The paper further deals with costs and the eSOS business model, its challenges, applicability and relevance. The first application, currently taking place in the Philippines will bring valuable insights on the future of the eSOS smart toilet. It is expected that eSOS will bring changes to traditional disaster relief management.

**Key words** | emergency, feces, sanitation, technology, toilet, urine

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#### EMERGENCY SANITATION

In general, an emergency can be considered to be the result of a man-made and/or natural disaster, whereby there is a serious, often sudden, threat to the health of the affected community which has great difficulty in coping without external assistance. Emergency sanitation intervention is a means of promoting best management practice in order to create a safer environment and minimize the spread of disease in disaster-affected areas, and of controlling and managing excreta, wastewater, solid waste, medical waste, and dead bodies. In June 2012, an international emergency sanitation conference was hosted by UNESCO-IHE in Delft where more than 200 experts from relief agencies, governments, academia and industry gathered, and discussed emergency excreta management and public health. It was

confirmed that (i) emergency-specific sanitation is not at the forefront of the scientific community, (ii) current solutions are in most cases technologically and economically suboptimal, (iii) there is, in general, insufficient communication between key stakeholders, (iv) academia and practitioners are insufficiently involved, (v) emergency sanitation (technological) development is often associated with drivers such as humanitarian aid agencies or the army, (vi) emergency water supply is given much more attention than sanitation, and (vii) the smart innovative emergency sanitation management (and governance) system is lacking. This concept aims to address these deficiencies and provide sustainable, innovative, holistic, and affordable sanitation solutions for emergencies (such as floods, tsunamis, volcano