

Learning brief March 2024



# Safe reuse practice in faecal sludge treatment plant: Producing compost using treated faecal sludge

SNV aims to support local governments in developing reuse options for faecal sludge that are environmentally safe, socially acceptable, and financially sustainable. For SNV, the selection of reuse options must remain within current legislation so that it is possible to scale them up. Ultimately, the potential income generated from reuse practice is expected to reduce operation and maintenance costs of faecal sludge treatment plants (FSTPs). Thus, better and optimal treatment processes could be cultivated.

## **Key lessons**

- Producing organic compost from treated faecal sludge is feasible provided attention is paid to laboratory tests that ensure the standard nutrient content is met, and that no harmful pathogens are present.
- A legal wastewater institutional framework that permits business generation needs to be in place.
- Suitable areas inside FSTPs need to be included during construction planning to give space for reuse practice.
- Further market research needs to be conducted to assess the level of demand for using organic compost derived from faecal sludge for domestic use.

#### Background

The volume of treated faecal sludge produced will soon increase to the point at which it will not fit into the available space at FSTPs, unless there is area expansion. However, expanding the FSTP area requires high capital expenditure. Hence, there is an emerging need to look for alternative ways to reduce the volume of treated sludge. Reuse practice of treated faecal sludge is one option. Reuse also has economic benefits that could contribute to the operation and maintenance cost of FSTPs, and be used for further business development by operators.

#### Main issues

The promotion of safely managed sanitation has resulted in high demand for septic tank desludging in three Indonesian cities: Bandar Lampung, Metro, and Tasikmalaya. This has inevitably led to an increase in the volume of faecal sludge that requires treatment. However, due to a lack of experience, sludge is fast accumulating in the FSTPs. This accumulated faecal sludge could cause operational failures in the future if it is not treated properly. Moreover, wastewater management operators in three cities still use a conventional FSTP system, which draws on open ponds to treat wastewater. Limited awareness from operators heightens the risk of their exposure to harmful pathogens from the sludge. Furthermore, studies on the potential economic, social, and environmental threats from the faecal sludge are yet to be explored, but it is known that accumulated sludge releases greenhouse gases to the environment.



Figure 1. Some reuse options for treated faecal sludge

#### Our approach

SNV aimed to explore nature-based solutions to tackling the issue of increasing volumes of treated faeca tance and developed technology options for public operators to reuse faecal sludge.

Through a series of discussions, SNV conducted a pilot project to produce organic compost using a faecal sludge mixture. The main objective of the pilot was to provide options for operators to improve their service performance. The pilot project began in Tasikmalaya city in 2021, when compost was produced from faecal sludge in FSTPs using a 24-hour composting process. Different compositions of treated faecal sludge were tested with other organic waste to produce two qualities of compost; one that was of a sufficient quality to be used and another that could be sold. Eight compositions were tested on decorative plants, soy plants, and oil palms. The project also conducted market research through focus group discusions with compost sellers, decorative plant sellers, and community groups to ascertain their perspectives and levels of demand for compost produced from treated faecal sludge. Compost

product

Preparing the treated sludge

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Mechanised composting process Mixing the compost with soil, based on research composition Planting process to decorative plant, soybean, and palm oil Plant measurement against research indicator

Figure 2. Faecal sludge compost production in Tasikmalaya

## Vermicomposting in Bandar Lampung and Metro City

In Bandar Lampung and Metro, the project took a more empirical approach. In both cities, the composting process used earthworms, which acted as natural composters and mixers. Ten to 12 boxes were tested in FSTP Bakung in Bandar Lampung and FSTP Karangrejo in Metro, each consisting of a different mixture of faecal sludge, type of organic waste, and with varying weights of earthworms used.

SNV collaborated with the cities' reuse and recycling centres, particularly in Metro City. In doing so, it aimed to generate a sustained uptake of faecal sludge reuse practice and the production of compost. Moreover, the project assisted in the recovery of the FSTP's operation and maintenance costs through revenue calculations and the development of a business plan to sell the compost.

'After I used the compost to grow my chili plant, the results are really good. In the near future, I would like to use this compost to grow another plant.'

**Ratna**, Member of Women's Farmer Group during a Focus Group Discussion in Tasikmalaya

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## **Key results**

- Visual observations from plant testing found that plants grown in compost from faecal sludge produced in the 24-hr composting machine in Tasikmalaya had taller stems, more leaves, and more flowers compared to those grown in regular organic compost.
- The organic compost made from treated faecal sludge and an additional organic mixture in the 24-hr composting machine was better quality than marketed organic compost, whilst in compliance with Indonesian Agriculture Law.
- Laboratory test results showed that e. coli bacteria were not found in any of the compost produced in the 24-hr composting machine, or by vermicomposting.

• The revenue calculations revealed that more can be made from vermicomposting by selling the earthworms used. During the composting process, the number and size of the earthworms almost doubled.

**About SNV:** SNV is a global development partner, rooted in the African and Asian countries where we operate. With 60 years of experience and a team of approximately 1,600 people, it is our mission to strengthen capacities and catalyse partnerships that transform the agri-food, energy, and water systems to enable sustainable and more equitable lives for all.

**About WASH SDG:** WASH SDG was a consortium programme whose members – SNV, WAI, and Plan – aimed to sustainably improve access to, and use of safe drinking water for at least 450,000 people, sanitation for at least 2 million people, and improve the hygiene behaviours of 1.6 million people. Supported by the Directorate-General for International Cooperation (DGIS) of the Government of the Netherlands, the programme was coordinated by Simavi. Author: Annisa Pramesti Putri

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**Cover photo:** An FSTP operator in Bandar Lampung collects treated sludge from the mechanical system for further reuse or disposal. Photo credit: SNV/OTMI Indonesia.

**Suggested citation**: SNV, 'Safe reuse practice in faecal sludge treatment plant: Producing compost using treated faecal sludge,' *SNV Learning Brief*, Jakarta, SNV, 2024.

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